Surface Water and Groundwater Technical Report

Rail Tie Wind Project
Albany County, Wyoming

Prepared for:

ConnectGen Albany County LLC

April 2020

TETRA TECH

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1 INTRODUCTION

At the request of ConnectGen Albany County LLC (ConnectGen), Tetra Tech, Inc. (Tetra Tech) has prepared this Surface Water and Groundwater Technical Report for the Rail Tie Wind Project (Project). This document is intended to provide reviewing regulatory agencies with information on surface water resources, including wetlands and other waterbodies that could be potential Waters of the U.S. (WOTUS), and groundwater resources associated with the Project. This report also includes information on potential development constraints and regulatory requirements that the Project may encounter.

1.1 Project Background

The Project is located in southeastern Albany County, Wyoming, and encompasses approximately 26,000 acres of ranchland on private and state lands near Tie Siding, Wyoming (Project Area; Figure 1). The Project would include up to 149 wind turbine generators, each ranging between 3.0 to 6.0 megawatt (MW) in size, with a combined maximum generating capacity rating of 504 MW. The Project proposes to interconnect to the existing transmission system of the Western Area Power Administration (WAPA) via the Ault-Craig 345-kilovolt (kV) transmission line, which runs through the Project Area.

For construction planning and site optimization, the Project consists of two separate phases, each approximately 252 MW. Construction of the Project is expected to begin in 2021, and both phases could be fully operational by the end of 2022. As is common with large wind projects, the Project may require 2 years to fully construct. If additional time is required to facilitate construction, it is anticipated that the first 252 MW phase would be completed and fully operational by the end of 2022, and second phase operational in 2023.

1.2 Analysis Area

This report analyzes the hydrogeographic surface water and groundwater regions potentially impacted by the Project.

In order to focus the review of potential impacts of Project development to wetlands and other waterbodies, ConnectGen developed a Project Siting Corridor as described below to capture all areas where potential Project ground disturbance may occur (Figure 2).

To quantify the potential impacts, ConnectGen identified a representative Project Layout as described below that provides the basis for determining the estimated permanent and temporary ground disturbance impacts to wetland and other waterbodies resulting from the development of the Project (Figure 2).

1.2.1 Project Siting Corridor

ConnectGen has identified a series of 1,000-foot-wide turbine siting corridors as well as a detailed network of access road, collection system, and crane walk design as part of the site plan

development for both the 3.0 MW and 6.0 MW turbine layouts. This area, herein referred to as the Project Siting Corridor, encompasses all potential Project features (regardless of the selected turbine model) along with an appropriate buffer to capture areas where potential ground disturbance may occur.

The Project Siting Corridor consists of the 1,000-foot-wide turbine siting corridors, 100-foot-wide access road and crane path corridors, 50-foot-wide collection line corridors, 150-foot-wide transmission line corridor, proposed operation and maintenance facility, temporary laydown yards, permanent meteorological (met) tower locations, Project substations, and interconnection switchyard location.

1.2.2 Representative Project Layout

To quantify the potential ground disturbance impacts of the Project, ConnectGen provided a representative physical footprint of all Project facilities and appurtenances that may be necessary for the Project, referred to as the Representative Project Layout. The Representative Project Layout is meant to reflect the largest proposed Project footprint (i.e., most conservative for estimate of impacts) and includes 151 turbine locations within the twenty 1,000-foot-wide turbine siting corridors, approximately 60 miles of access roads, approximately 15 miles of crane paths, approximately 80 miles of collection lines, approximately 4 miles of 345-kV transmission line, 3 proposed permanent met tower locations, 2 Project substations, an interconnection switchyard, operation and maintenance building, and 2 temporary laydown yards. The representative Project Layout and anticipated area required for construction and operation of each Project feature provide the basis for determining the estimated permanent and temporary disturbance for the Project.

2 REGULATORY FRAMEWORK

2.1 Federal Regulations

2.1.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires the disclosure of potential environmental impacts for projects with a federal action, through either a Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement (EIS), as well as a process of public and agency review and comment.

WAPA's action on the interconnection request is considered a major federal action subject to NEPA, in accordance with Council on Environmental Quality (CEQ) regulations for implementing NEPA, and DOE NEPA Implementing Procedures (40 CFR Parts 1500−1508, 10 CFR Part 1021). This technical report provides information to assist WAPA in the analysis of the potential effects to the natural and human environments associated with approving or denying the interconnection request.

As the lead federal agency for NEPA compliance, WAPA is also responsible for compliance with Executive Order (EO) 11990 and EO 11988 for WAPA's proposed federal action. The requirements of EO 11990 and EO 11988 are implemented under 10 CFR 1022 (Compliance with Floodplain/Wetlands Environmental Review Requirements). The provisions of EO 11990, Protection of Wetlands, May 24, 1977, directs that actions should be taken to minimize the destruction, loss, and degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetland ecosystems. The provisions of EO 11988, Floodplain Management, May 24, 1977, direct that actions should be taken to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values provided by floodplains.

2.1.2 Clean Water Act

All discharges of dredged or fill material that result in permanent or temporary losses of jurisdictional WOTUS are regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA). The USACE regulates projects in navigable water under Section 10 of the Rivers and Harbors Act.

Under USACE and U.S. Environmental Protection Agency (EPA) regulations (33 CFR 328[e]), wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Several classes of waterbodies are subject to federal jurisdiction under the CWA, including traditional navigable waters (TNWs); non-navigable tributaries of TNWs that are relatively permanent waters (RPWs); and wetlands that directly abut RPWs (USACE 2007). In non-tidal waters, the lateral extent of USACE jurisdiction for waterbodies in the absence of adjacent wetlands is determined by the ordinary high water mark (OHWM), which is defined as the "line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR 328.3(e)).

On January 23, 2020, the EPA and USACE, per Executive Order 13788, finalized the Navigable Waters Protection Rule, which identifies four categories of waters that are federally regulated under the CWA and would be considered jurisdictional WOTUS:

1. Territorial seas and TNWs
2. Perennial and intermittent tributaries to territorial seas and navigable waters
3. Certain lakes, ponds and impoundments of jurisdictional waters;
4. Wetlands adjacent to other jurisdictional waters

The final rule also identifies waters/features that are not considered jurisdictional WOTUS, including ephemeral features, groundwater, many farm and roadside ditches, and artificial lakes and ponds. The new rule is scheduled to go into effect 60 days after publication in the Federal Register; however, implementation of the rule may be delayed by legal challenges.

Impacts to WOTUS from construction of the Project will require either a nationwide permit (NWP) or an individual permit (IP). Impacts under the 0.5-acre limit for IPs may be permitted under the NWP program. The NWPs are issued by the USACE under CWA Section 404(e) for projects expected to have minimal individual or cumulative effects and are pre-certified under CWA Section 401. Permanent impacts to jurisdictional features exceeding 0.1 acre would likely require a pre-construction notification (PCN) under the nationwide permit program and an approved jurisdictional determination by the USACE.

If the Project impacts are larger than 0.5 acre of wetlands or 300 linear feet of stream bank, USACE will require an IP, which requires development of a formal mitigation plan. Issuance of an IP would be a federal action that would trigger compliance with NEPA under a separate review process by USACE. IPs also require state water quality certification under CWA Section 401.

Section 401 of the CWA requires that any applicant for a Section 404 permit in Wyoming provide certification to the USACE from the Wyoming Department of Environmental Quality (WDEQ) Water Quality Division (WQD) that the activity complies with State water quality requirements. Certification under Section 401 can be granted under the nationwide permitting process for most areas in Wyoming. The permit process timeline is part of the permitting timeline for the Section 404 permit application process to USACE. If an individual Section 401 permit is required, WDEQ conducts a separate public notice and comment period prior to issuing the Section 401 certification.

2.1.3 Endangered Species Act

The Project Area is located within the Platte River Basin, which is the major hydrologic basin from which water would be appropriated for use for Project construction and operation. Consumption of groundwater or surface water that could result in depletions to flows in the Platte River System are a concern under the Endangered Species Act (ESA) due to potential downstream impacts to federally listed threatened and endangered species habitat associated with the Platte River in Nebraska.

In 1997, Colorado, Wyoming, Nebraska, and the Department of Interior partnered together to develop the Platte River Recovery Implementation Program (PRRIP). Under the program, projects that include water-related activities in the Platte River Basin that have a federal nexus may be subject to consultation under Section 7 of the ESA. These activities include new or expanded wells, reservoirs, or diversions whose water supply is solely derived from sources that are considered “hydrologically connected” to the Platte River and that meet or exceed the de minimis threshold of 0.1 acre-foot per year of depletions in flow to the nearest surface water tributary to the Platte River System. Activities subject to consultation are required to conduct a

depletions analysis and seek streamlined ESA consultation through the PRRIP or conduct independent Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS). In Wyoming, the PRRIP is implemented through the Wyoming Depletions Plan and administered by the Wyoming State Engineer's Office.

2.2 State Regulations

2.2.1 Wyoming Industrial Development Information and Siting Act

The WDEQ Industrial Siting Division (ISD) administers the Wyoming Industrial Development Information and Siting Act (Act; Wyoming Statute § 35-12-101:119) and the Rules and Regulations of the Industrial Siting Council (ISC), Chapters 1 and 2. The Act is designed to protect Wyoming's environmental, social, and economic fabric of communities from unregulated large-scale industrial development. By consolidating the review of 19 independent state agencies into one comprehensive permitting process, the Act offers a thorough analysis of the development's impacts to the public and affected agencies.

Pursuant to the Act, all wind energy projects consisting of 30 or more turbines (in all planned phases of the installation) and/or exceeding the statutory threshold construction cost amount of $222.8 million are subject to review and approval by the ISC. For facilities permitted under Wyoming Statute (W.S.) § 35-12- 102(a)(vii)(E) and (F), a site reclamation and decommissioning plan and a financial assurance plan are required pursuant to W.S. § 35-12-105(d) and (e).

As part of the review and approval process, the ISC requires submittal of an application outlining the evaluation of potential project impacts and mitigation measures related to environmental, social, and economic resources.

2.2.2 WDEQ Impaired Waters

WDEQ-WQD is responsible for administering Sections 305(b) and 303(d) of the CWA in Wyoming. Section 305(b) of the CWA requires states to describe the water quality condition of all their waters, including all designated use determinations. In addition, Section 303(d) of the CWA requires that a state develop a listing of all waters that do not fully support existing or designated uses and require development of a Total Maximum Daily Load (TMDL). Wyoming's assessment program makes use-support determinations based on scientifically valid, objective, and representative data and assessments. Generally, a water is deemed to be "non-supporting" of one or more designated uses ("impaired") if any narrative or numeric criteria are exceeded or designated uses are shown to be adversely affected by man's activities. The WDEQ assessment methodology outlines the criteria and decision-making processes employed by the agency for the purpose of making designated use support determinations about the water quality of surface waters of the state.

2.2.3 Wyoming Pollution Discharge Elimination System General Permit

Wyoming has been delegated permit authority for the National Pollutant Discharge Elimination System. The WDEQ-WQD is the state agency responsible for regulating the Wyoming Pollutant Discharge Elimination System (WYPDES) program in the state of Wyoming. Construction activities that disturb between 1 and 5 acres, or less than 1 acre if part of a plan of development, require a Small Construction General Permit. Construction activity that disturbs 5 acres or more of land require a WYPDES Large Construction General Permit (LCGP) under Section 402 of the CWA. LCGP also require a complete Stormwater Pollution Prevention Plan (SWPPP).

Both the WYPDES large and small construction stormwater permits now cover discharges from construction dewatering if those discharges are accumulated stormwater with only minor amounts of groundwater.

2.2.4 Wyoming Wetlands Act

The Wyoming Wetlands Act is a notification program for draining wetlands over 5 acres. It applies to any “naturally occurring or man-made wetland, or any series thereof, which has an area comprising five acres or more.” The act requires that a party wishing to drain a wetland submit the appropriate paperwork to WDEQ. There is no application or approval process. The act also established a mitigation banking program. If a party fails to comply with the notification requirement, he or she may not take advantage of the banking program (W.S. § 35-11-301 to 35-11-313).

2.2.5 General Permit for Wetland Mitigation

The WDEQ-WQD is also responsible for isolated wetlands (wetlands not under CWA Section 404 jurisdiction) and may require a general permit if isolated wetlands are disturbed by Project construction. Under the (WYPDES program, this general permit for isolated wetlands mitigation authorizes the discharge of fill or dredge material into (1) naturally occurring isolated wetlands or (2) man-made isolated wetlands used to mitigate the loss of naturally occurring wetlands. This permit applies to the loss or destruction of greater than 1 cumulative acre of isolated wetland habitat for a total project. Coverage under this permit requires a Mitigation Plan to offset the loss of wetland functions and values such that project activities result in no net loss of wetlands.

2.2.6 Wyoming State Engineer’s Office Water Permits

The Surface Water and Engineering Division of the State Engineer’s Office (SEO) is responsible for reviewing permit applications for any request for putting surface waters of the state to a beneficial use. Permits are required for transporting water through ditch or pipelines, for storage in reservoirs, for storage in smaller reservoir facilities for stock water or wildlife purposes (less than 20 acre-feet of capacity and a dam height 20 feet or less), for enlargements to existing ditch or storage facilities, and for instream flow purposes.

In Wyoming, water may be appropriated from an existing right holder, such as a municipal water source, in accordance with a Temporary Water Use Agreement between the water user and water right holder (W.S. 41-3-110). This contract must identify the source of the water, the amount of the appropriation, and the proposed temporary use, and is subject to approval by the Wyoming SEO. The duration of the temporary water use may not exceed 2 years, at which point a new agreement is required.

Development of new water supply wells requires an applicant to obtain an approved Permit to Appropriate Ground Water from the Wyoming SEO prior to the commencement of any drilling or completion activities (W.S. 41-3-930). The applicants must identify the location and beneficial use of the proposed appropriation. After the well is completed, the applicants must submit a statement of completion and description of the well, as well as provide proof of the appropriation and beneficial use.

If an applicant for an ISC Permit plans to construct a facility that will use more than 800 acre-feet (260.7 million gallons) of water per year, the applicants must submit a water supply and water yield analysis to the Wyoming SEO. The State Engineer then reviews the analysis in order to "render a preliminary opinion as to the quantity of water available for the proposed facility." This preliminary opinion is made available for public comment prior to preparation of a final opinion. The State Engineer's final opinion is binding on the ISC (W.S. §35-12-108).

In addition to issuance of water permits, the Wyoming SEO is also responsible for review of water-related activities in the Platte River Basin of Wyoming that have a federal nexus and may be subject to consultation under Section 7 of the ESA. This involves review of the proposed activity and a depletions analysis, if necessary, in order to determine whether the project qualifies for coverage under the Wyoming Depletions Plan.

2.2.7 Construction Dewatering Permit

Both the WYPDES large and small construction stormwater permits cover discharges from construction dewatering if those discharges are accumulated stormwater with only minor amounts of groundwater (WDEQ 2019a). Discharges that have a significant groundwater component and that are pumped or siphoned to a storm drain or may reach a surface water of the state, directly or by overland flow, are considered a process wastewater and must be covered under a separate WYPDES permit for wastewater discharges. In general, most short-term construction dewatering discharges to storm drains or surface waters may be covered under a general permit specifically written for short-term, temporary discharges. If construction site water will be applied to the land surface so that it will not run off to surface waters, the local District Engineer need to determine if a "Land Application" permit is required.

2.3 Local Regulations

2.3.1 Wind Energy Conversion System Permit

The Albany County Wind Energy Siting Regulations require all facilities with an aggregate generating capacity greater than 25 kilowatts to apply for a Wind Energy Conversion System (WECS) Use Permit (Albany County 2017). The application process involves the review and recommendation of the Planning and Zoning Commission and the approval of the Board of County Commissioners, as well as community input during a defined and requisite public hearing and comment period (§§18-5-502(a)). The WECS permit applicants must certify that the Project would comply with all applicable state and county zoning and land use regulations. As part of the application, potential impacts to resources such as economic, air quality, water quality, general nuisances, soil disturbance, wildlife, and cultural resources must be addressed.

2.3.2 Floodplain Development Permit

The Albany County Flood Damage Prevention Ordinance guides development and protection of property in floodplains within Albany County. The basis for establishing the areas of special flood hazard are the Flood Insurance Rate Maps provided by the Federal Emergency Management Agency (FEMA). The ordinance requires a Floodplain Development Permit be submitted to the County containing an elevation certificate provided by a licensed engineer stating that the structure's lowest floor has been elevated to 1 foot above base flood elevation.

This permit is required for all Project structures and buildings located within a floodplain zone on privately-owned lands. WECS siting approval is required prior to submittal of a Floodplain Development Permit.

3 METHODOLOGY

3.1 Desktop Review

Tetra Tech reviewed publicly available information contained on websites, databases, maps, and scientific literature to identify surface water and groundwater resources associated with the Project, including:

- U.S. EPA Ecoregions
- Western Regional Climate Center precipitation data
- U.S. Geological Survey (USGS) water gauging stations
- WDEQ Section 303(d) impaired waters
- National Land Cover Database (NLCD)
- Natural Resources Conservation Service (NRCS) Web Soil Survey
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps
- USGS National Hydrography Dataset (NHD)
- USFWS National Wetlands Inventory (NWI)
- USDA's National Agriculture Imagery Program (NAIP) for aerial photo interpretation

- Wyoming State Geological Survey (WSGS) Platte River Basin Water Plan Update
- Wyoming SEO well permit database
- Surface Waters Assessment Report and geotechnical studies conducted as part of the Hermosa West Wind Energy Project
- Wyoming Game and Fish Department (WGFD) scoping response letter to WAPA received January 29, 2020

The types of data utilized for review from each of the sources listed above is further detailed in the description of existing resources outlined in Section 4.

3.2 Field Reconnaissance

Two Tetra Tech biologists conducted a field reconnaissance of the Siting Corridor from September 18 to 23, 2019. The goal of the field reconnaissance was to identify and map the conservative boundaries of potential wetlands and other waterbodies that could potentially be WOTUS within the Siting Corridor based on the results of the desktop review in order to support micrositing of Project features.

In addition to NHD and NWI data, the biologists used aerial imagery and observation of topographic conditions across the Siting Corridor to focus on the location of potential surface water resources, including areas of low topography, riparian or streamside settings, depressional areas, pond shorelines, and springs/seeps.

The biologists surveyed the Siting Corridor by vehicle and by foot, utilizing electronic tablets to collect representative data points, photographs, and wetland boundaries. The field team mapped probable wetland boundaries utilizing an Arrow 100 GPS system with submeter accuracy that was bluetoothed to a field table computer running Trimble Collector. Photographs of each wetland and other waterbody feature were taken, and detailed notes of each feature were recorded in a field logbook.

A formal wetland and other WOTUS delineation based on USACE protocols was not undertaken during this field reconnaissance. However, boundaries of potential wetland and other waterbody features were identified based on an understanding of the methodology described in the Corps of Engineers Wetlands Delineation Manual (USACE 1987), Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0; USACE 2010), and A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States (USACE 2014).

Potential wetland boundaries were identified and mapped based on direct observation of dominant wetland vegetation in the landscape. Wetland vegetation was identified using the wetland indicator status outlined in the 2016 National Wetland Plant List (Lichvar 2016). Plant communities that were observed to be dominated by Facultative (found 33 to 67 percent of the time in wetlands), Facultative Wetland (found 67 to 99 percent of the time in wetlands), and

Obligate (found more than 99 percent of the time in wetlands) plant species were judged to be potential wetland locations. Potential wetlands identified and mapped during the site reconnaissance were subsequently classified in accordance with the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). Wetlands were identified as palustrine (non-tidal) emergent wetlands (PEM) or palustrine scrub/shrub wetlands (PSS). Emergent wetlands consist of rooted herbaceous and grasslike wetland plants that stand erect above the water or ground surface. Scrub/shrub wetlands consist of wetlands dominated by woody vegetation less than 20 feet tall with 20 percent or greater scrub/shrub cover.

All stream features and other waterbodies, including drainage ditches and ponds, were identified and mapped based on the presence of an OHWM, as outlined in Section 2.1.2. The centerline was mapped for all stream features with an OHWM width of less than 10 feet. For those stream features with an associated wetland fringe, the wetland boundary was mapped inclusive of the stream feature. Stream features were classified based on flow regime (perennial, intermittent, or ephemeral).

In addition, upland data points were taken at all locations identified by the NHD or NWI as potential streams or wetlands that were ultimately determined not to support wetland or other waterbody features.

Representative photos of the Siting Corridor, wetland and other waterbodies, as well as upland features identified during the field reconnaissance, are provided as Photos 1 to 16 in Appendix A. A list of all plant species identified during the reconnaissance is provided as Appendix B.

4 EXISTING ENVIRONMENT

4.1 Surface Water

4.1.1 Project Setting

The Project Area is located within the Laramie Basin and Crystalline Mid-Elevation Forests Level IV EPA Ecoregions (Chapman et al. 2004). The Laramie Basin Ecoregion, which encompasses the majority of the western portion of the Project Area, is an intermontane valley containing primarily mixed-grass prairie. The topography of this ecoregion is nearly flat with elevations ranging from 7,100 to 7,900 feet above sea level. Average annual precipitation ranges from ten to 16 inches and the mean high temperature ranges from 32°F in January to 80°F in July. Vegetation includes mixed-grass prairie species such as blue grama (*Bouteloua gracilis*), Indian ricegrass (*Oryzopsis hymenoides*), western wheatgrass (*Pascopyrum smithii*), rabbitbrush (*Ericameria* and *Chrysothamnus* spp.), and fringed sage (*Artemisia frigida*). The Crystalline Mid-Elevation Forests Ecoregion, which encompasses the central and eastern portions of the Project Area, consists of low mountain slopes and outwash fans between 7,500 and 9,000 feet above sea level. Average annual precipitation ranges from 18 to 26 inches and the mean high temperature ranges from 32°F in January to 80°F in July. Dominant vegetation includes lodgepole pine (*Pinus contorta*) and Douglas fir (*Pseudotsuga menziesii*) forests with areas containing

limber pine (*Pinus flexilis*) and quaking aspen (*Populus tremuloides*). Representative landscape photographs of the Siting Corridor are provided as Photos 1 through 4 in Appendix A.

According to the Western Regional Climate Center, average annual precipitation for Laramie area is 10.52 inches, with the wettest months occurring in May and July, both with an average of 1.5 inches of precipitation (WRCC 2016). Average total snowfall for the area is 48.5 inches. As noted in the Surface Waters Assessment Report completed as part of the Hermosa West Wind Energy Project (ERM 2010), the basic hydrology of the Project Area is typical of the mountainous high plains of Wyoming. Water is stored in the mountainous headwaters and is released throughout the year, and rainfall runoff is a small component of overall streamflow. Snowmelt runoff peaks in May through July. The numerous ephemeral and intermittent streams in the Project Area indicate that base flow and rainfall-driven streamflow are low.

The Project Area is located within both the Laramie River-Harney Creek sub-basin (HUC 1018001004), which encompasses the northwestern portion of the Project Area, and the Dale Creek sub-basin (HUC 1019000704), which encompasses the southern and eastern portions of the Project Area (Figure 1). The Laramie River-Harney Creek sub-basin is part of the Upper Laramie River sub-basin (HUC 10180010). Its major drainage, the Laramie River, drains north into Wyoming from its headwaters within the southern Medicine Bow Mountain Range in Colorado, ultimately draining into the North Platte River. The Dale Creek sub-basin is part of the Cache la Poudre sub-basin (HUC 10190007). Its major drainage, the Cache la Poudre River, drains east across northern Colorado from its headwaters along the Front Range, ultimately draining to the South Platte River.

4.1.2 Surface Water Quantity and Quality

There are no established surface water gauging stations located on streams within Project Area (USGS 2020). The closest USGS gauging station, Sand Creek at the Colorado-Wyoming State Line (#06659580), is likely most reflective of surface flow conditions within the Project Area. Flow at Sand Creek (drainage area = 29.2 square miles) in 2019 ranged from below 1 cubic feet/second to 127 cubic feet/second (USGS 2020).

Section 303(d) of the CWA requires that States provide a list of waters that are impaired by pollution, even after application of pollution controls. For those waters, states must establish a total maximum daily load (TMDL) of pollutants to ensure that water quality standards can be attained. According to the Draft 2020 WDEQ Integrated 305(b) and 303(d) Report, neither the Laramie River-Harney Creek sub-basin nor the Dale Creek sub-basin contain stream segments that have been assessed for water quality, and do not contain any 303(d) impaired waters (WDEQ 2019b). The USGS does not have any water quality monitoring stations within the North Platte or South Platte River Basins in Wyoming (USGS 2020).

Field surveys completed as part of the Surface Waters Assessment Report for the Hermosa West Wind Energy Project did not produce any evidence of recent slumps, earth flows, debris flows, avalanche activity in the watershed or in near waterways (ERM 2010). Channel down-cutting was

noted within portions of Government Creek, Forest Creek, Willow Creek, and Fish Creek, and an erodibility risk of low to medium was determined for all stream segments within the project. The study noted that, while the watershed associated with the project was not expected to contribute marked changes in sediment load due to soil impact minimization and maintenance of drainage patterns and vegetation cover during development of the project, impacts to stream channel carrying capacity and morphology due to construction of road crossings was possible.

In a WGFD scoping response letter to WAPA received January 29, 2020, WGFD noted that the Harney Creek-Laramie River sub-basin contains two WGFD Species of Greatest Conservation Need, the brassy minnow (*Hybognathus hankinsoni*) and common shiner (*Luxilus cornutus*; WGFD 2020). WGFD recommended that a Reconnaissance Level Assessment (RLA) be completed for that portion of the Project that lies within this sub-basin (Figure 1). Based on the recommendations of WGFD, ConnectGen plans to conduct an RLA or similar method for the portion of the Project that occurs within the Harney Creek-Laramie River sub-basin to determine the potential for any Project impacts to aquatic resources within this sub-basin. Similar to the Surface Waters Assessment Report completed for the Hermosa West Wind Energy Project, this RLA will provide information on erodibility risk of surface water resources within the sub-basin.

4.1.3 Land Cover and Land Use

Concurrent with the field reconnaissance completed as part of the wetland and other waterbodies mapping effort, Tetra Tech biologists completed field-based ground-truthing of land cover types for the Project Area in September 2019 based on land cover types identified by the NLCD (Yang et al. 2018). Methodology for this field effort is discussed in Tetra Tech's Biological Resources Evaluation (in preparation). The results of that effort indicate that the Siting Corridor has a dominant land cover of scrub/shrub vegetation (96.3 percent; Table 1; Figure 3). Other land cover types present within the Siting Corridor are generally similar to NLCD cover, and include emergent herbaceous wetland (1.23 percent), primarily mapped along the major stream features associated with the Siting Corridor, evergreen forest (0.84 percent), primarily located within the southernmost portion of the Siting Corridor, as well as barren land (1.49 percent), located primarily within the northern portions of the Siting Corridor (Figure 3).

Scrub/shrub cover throughout the Project Area and Siting Corridor is primarily comprised of the Wyoming Basins Dwarf Sagebrush Shrubland and Steppe ecological system (NatureServe 2019). This ecological system is common in the windswept high-elevation basins within central and southern Wyoming, and is associated with shallow, rocky soils. As reflected within the Project Area and Siting Corridor, where graminoids are common and tall, the vegetation within this system often has the appearance of grassland without shrubs when viewed from a distance. Within the western portion of the Project Area and Siting Corridor, this habitat has been heavily grazed by cattle.

Land use within the Laramie Basin Ecoregion generally consists of seasonal grazing of livestock. Land use within the Crystalline Mid-Elevation Forests Ecoregion consists of livestock grazing, logging, recreation, and mineral extraction (Chapman et al. 2004). Within the Project Area and

Siting Corridor, land use is primarily ranchland, with scattered residential properties that are generally associated with ranching activities.

Table 1: Field-Verified NLCD Land Cover Within the Siting Corridor

NLCD Description[1]	Acres within Siting Corridor	Percentage of Siting Corridor
Shrub/Scrub	5,970.80	96.30%
Evergreen Forest	51.81	0.84%
Barren Land	92.42	1.49%
Herbaceous Wetland	76.29	1.23%
Pasture/Hay	4.74	0.08%
Woody Wetland	1.23	0.02%
Deciduous Forest	0.75	0.01%
Open Water	2.05	0.03%
Total	6,200	100%

1 Source: National Land Cover Database (Yang et al. 2018)

4.1.4 Hydric Soils

Hydric soils are soils that form under conditions of saturation, flooding, or ponding for long enough periods during the growing season to develop anaerobic conditions in the upper portions of the soil. These soils can be indicative of locations where potential wetlands or other waterbodies may occur. The NRCS Web Soil Survey was evaluated to identify potentially hydric soils within the Siting Corridor (NRCS 2019). As outlined in Table 2, five hydric soil map units are present within the Siting Corridor, all listed as partially hydric (i.e., 33 to 65 percent of the soil unit consists of soils considered hydric). These hydric soil units are generally focused within the northeastern and southwestern portions of the Siting Corridor (Figure 4), and comprise approximately 1,896.7 acres of the Siting Corridor.

Table 2: NRCS Hydric Soil Types Within the Siting Corridor

Soil Map Unit Name[1]	Soil Map Unit Symbo[l1]	Landform	Acres
Canburn loam, 1 to 4 percent slopes	132	Flood plains	22.12
Dalecreek-Kovich complex, 0 to 9 percent slopes	149	Flood plains, drainageways	31.42
Hapjack-Rogert-Amesmont complex, 3 to 25 percent slopes	172	Mountain slopes	1,720.55
Rogert-Lakehelen-Rock outcrop complex, 8 to 40 percent slopes	219	Mountains, mountain slopes	1.61
Silas, gravelly substratum-Vensora loams, 0 to 6 percent slopes	227	Mountain slopes	121.00
		TOTAL	**1,896.70**

1 Source: NRCS (2019)

4.1.5 Floodplains

FEMA Flood Insurance Rate Map (FIRM) data were reviewed to determine whether 100-year (1 percent Annual Chance Flood Hazard) or 500-year (0.2 percent Annual Chance Flood Hazard)

floodplains are present in the Project Area (FEMA 2019). Review of the FEMA data indicates that approximately 15.75 acres of 100-year floodplains are mapped within the Siting Corridor (Figure 5), and are associated with Pump Creek, Dale Creek, and some of their associated tributaries in the northeast portion of the Siting Corridor.

4.1.6 National Wetlands Inventory

The USFWS NWI Program is intended as reconnaissance-level information on the location, type, and size of wetland resources. Analysis of the NWI data identified a total of 79.57 acres of wetlands within the Siting Corridor, including 24.91 acres of freshwater emergent wetlands, 8.07 acres of freshwater forested/shrub wetlands, 0.6 acre of freshwater ponds, and 45.99 acres of riverine wetlands (USFWS 2019; Figure 6). These NWI wetlands are primarily associated with the stream features and associated tributaries located throughout the Siting Corridor, and were used to ground-truth potential wetland locations during the September 2019 field reconnaissance of the Siting Corridor.

4.1.7 National Hydrography Dataset

The USGS NHD provides mapping for the nation's drainage networks and related features, including rivers, streams, canals, lakes, ponds, etc. The USGS produces the NHD to assist scientists with identifying the location and flow regime of water resources. Analysis of NHD data identified a total of 25.05 miles of streams within the Siting Corridor, including 2.99 miles of perennial streams, 21.25 miles of intermittent streams, 0.58 mile of ephemeral streams, and 2.58 acres of ponds (USGS 2019; Figure 6). This NHD data was used to ground-truth potential waterbody locations during the September 2019 field reconnaissance of the Siting Corridor.

Eight named streams are located within the Project Area, each of which intersects at least a portion of the Siting Corridor. These named stream features include Government Creek, Forest Creek, Boulder Creek, Willow Creek, Fish Creek, Dale Creek, Pump Creek, and Johnson Creek. Intermittent and ephemeral tributaries associated with these features are also present throughout the Project Area and Siting Corridor (Figure 6). The majority of drainages within the northwestern portion of the Siting Corridor drain into Willow Creek, a perennial stream that drains northwest into the Laramie River. The majority of drainages within the northeastern and southern portions of the Siting Corridor drain into Dale Creek, a perennial stream that drains south into the North Fork Cache la Poudre River. Both the Laramie River and North Fork Cache La Poudre River are drainages within the Platte River Watershed.

4.2 Groundwater

4.2.1 Aquifers

The Project Area is located within the Laramie Basin geological sub-region of the Platte River Basin (WSGS 2013). Within the Laramie Basin, the Project Area lies within the Casper groundwater system (Mazor 1990), which consists of Precambrian igneous and metamorphic rocks, Pennsylvanian Fountain Formation sandstone, and the Permo-Pennsylvanian Casper

Formation (interbedded sandstone, limestone, and dolomite). A series of faults act to deform the Casper groundwater system as it outcrops on the western flank of the Laramie Range. Mazor (1990) reports that Casper wells west of the confining contact are free-flowing. Free flowing, or artesian, wells occur due to groundwater that is under pressure from the confined condition of the aquifer. The Casper groundwater system receives recharge through local precipitation, and the direction of groundwater flow is normally east to west.

Three primary sub-aquifers are located within the Project Area. The northwestern portion of the Project Area lies within the Late-Paleozoic Aquifer system and pockets of the Quaternary Aquifer system-non-alluvial (Figure 7). The Late-Paleozoic Aquifer and the Quaternary Aquifer systems are described in the Wyoming State Geological Survey (WSGS) Platte River Basin Water Plan Update as the most extensively developed aquifers for high capacity wells within the Platte River Basin. The southern and eastern portions of the Project Area lie within the Precambrian Aquifer system (WSGS 2013; Figure 7).

Aquifers in the Paleozoic system are included in the Permian-age Forelle Limestone and Satanka Shale formations, which can reach thicknesses of approximately 1,000 feet along the western portion of the Project Area. The pockets of Quaternary Aquifer within the northwestern portion of the Project Area consist of alluvial deposits, mixed alluvium and colluvium, windblown sand deposits, and older terrace deposits, with thickness generally less than 50 feet. The Precambrian Aquifer includes the Sherman granite formation that underlies the entire Project Area.

Tributary interconnection between groundwater and surface water is a prominent water-rights issue in the Platte River Basin and conflicts among users within the state or across state lines can occur where groundwater extraction affects surface flows (WSGS 2013). In the Platte River Basin, there are significant judicial and regulatory constraints on the development of groundwater pursuant to the Platte River Recovery Implementation Program, as described above in Section 2.1.3. In 2001, the Modified North Platte Decree between the states of Wyoming and Nebraska outlined restrictions on Wyoming diversions of groundwater with priority dates later than 1945 that are hydrologically connected to surface water within the North Platte River Basin. In response to this Decree, the Wyoming SEO developed “Green Area” maps identifying areas where groundwater is considered to be not hydrologically connected to surface water within the North Platte River Basin. According to the Wyoming SEO “Green Area” maps, groundwater resources associated with the Harney Creek-Laramie River sub-basin, which covers the northwestern portion of the Project Area (Figure 1) are considered “not hydrologically connected” to the North Platte River Basin (WSGS 2013).

4.2.2 Groundwater Depth and Use

Table 3 provides a list of all water wells within the Project Area based on a search of the Wyoming SEO well permit database (Wyoming SEO 2019). Forty wells are located within the Project Area, most of which are used for domestic and livestock purposes. No municipal or community supply wells or injection wells are located in the Project Area (Wyoming SEO 2019). As noted in Table 3 and Figures 8-1 to 8-4, the majority of the wells (27) within the Project Area have a static water

depth of 10 feet or less, indicating the presence of shallow groundwater within the Project Area in response to localized confined conditions as discussed above. These water well depths are also supported by the mapped depth to groundwater levels (WDEQ 2019c) for the Project Area, as illustrated in Figures 8-1 to 8-4. These figures depict an area of shallow groundwater depth (0-10 feet below ground surface [bgs]) in the northeastern portion of the Project Area. The majority of the southern and western portions of the Project Area have water depths of 10 to 20 feet bgs, with a few locations with water depths of 20 to 50 feet bgs.

Table 3: Groundwater Well Depths Within the Project Area

SEO Permit Number	Well Uses [1]	Static Water Depth (Feet)	Well Depth (Feet)
P16219.0P	STK	3	6
P63327.0W	DOM_GW; STK	13	16
P16215.0P	STK	3	6
P42453.0W	STK	3	5
P40497.0W	STK	2	6
P16165.0P	STK	1	3
P73269.0W	STK	-4	4
P48411.0W	DOM_GW	14	40
P30938.0W	DOM_GW; STK	15	48
P130676.0W	DOM_GW; STK	32	200
P35805.0W	DOM_GW; STK	15	48
P16216.0P	DOM_GW; STK	2	5
P144335.0W	STK	0	0
P144334.0W	STK	63	300
P40498.0W	STK	2	6
P48410.0W	DOM_GW	14	35
P144595.0W	STK	49	200
P49883.0W	MIS	20	140
P92182.0W	DOM_GW	67	100
P16220.0P	STK	4	6
P161238.0W	STK	-4	2
P169788.0W	STK	0	0
P16217.0P	STK	3	6
P19334.0W	STK	8	12
P19333.0W	STK	8	12
P16218.0P	STK	3	6
P163098.0W	STK	0	4
P16221.0P	STK	3	6
P19335.0W	STK	8	12
P163097.0W	STK	0	4
P89309.0W	STK	35	75
P16167.0P	STK	1	4
P16163.0P	DOM_GW; STK	12	18
P16166.0P	STK	4	18

SEO Permit Number	Well Uses [1]	Static Water Depth (Feet)	Well Depth (Feet)
P16162.0P	DOM_GW; STK	1	8
P61655.0W	STK	4	7
P42455.0W	STK	3	5
P38528.0W	DOM_GW; STK	20	300
P59090.0W	STK	-4	6
P204768.0W	DOM_GW;STK	0	0

1 Well Use Codes: DOM—domestic; DOM GW—domestic groundwater; STK—stock; MON—monitoring; MIS—miscellaneous

In addition, information from two geotechnical studies conducted for the Hermosa West Wind Energy Project were reviewed (Black & Veatch 2009, 2010). Subsurface conditions were investigated in the western portion of the Project Area by drilling six borings on July 21 and 22, 2009, and six additional borings on November 2 through 5, 2009. The borings were drilled to depths from 7.5 to 45 feet bgs and bedrock was encountered from 2.5 to 34 feet bgs. Of the 12 boring locations, only two encountered groundwater—one at a depth of 27.5 bgs and one at a depth of 28 feet bgs. Geotechnical studies have not been conducted for the eastern portion of the Project Area.

Wyoming water law operates under the prior appropriation doctrine, or "first-in-time, first-in-right." Those holding an earlier priority water right are allowed to receive their full portion of water before those with junior rights may receive water under their right. Water rights can be issued to anyone who plans to make beneficial use of the water. Recognized beneficial uses include irrigation, municipal, industrial, power generation, recreational, stock, domestic, pollution control, instream flows, and miscellaneous. Water rights holders are limited to withdrawals necessary for the specified purpose.

Water used for Project construction would likely to be obtained from either temporary groundwater wells or from an offsite water purveyor. During Project operations, it is anticipated that either an existing landowner well or a new domestic well will be utilized to support onsite staff at the operations and maintenance (O&M) building. Use of groundwater for both construction and operation of the Project will be subject to regulation by the Wyoming SEO.

4.2.3 Groundwater Quality

According to the 2013 Platte River Basin Water Plan Update Groundwater Study, groundwater quality in the Platte River Basin varies widely, even within a single hydrogeologic unit (WSGS 2013). Water quality in any given hydrogeologic unit tends to be better near outcrop areas where recharge occurs, and tends to deteriorate as the distance from these areas increases (and residence time increases) (. In general, the water quality in a given hydrogeologic unit generally deteriorates with depth. This appears to be most directly associated with Total Dissolved Solids (TDS) concentrations in the groundwater, which tend to be high with respect to the EPA

Secondary Maximum Contaminant Level (SMCL) standards in most of the Platte River Basin, even in water from shallow wells (WSGS 2013).

The Project Area is located in an area mapped with high aquifer sensitivity (WSGS 2013). Aquifer sensitivity refers to the relative potential for a contaminant to migrate to the shallowest groundwater, based solely on hydrogeologic characteristics. In general, the aquifer sensitivity in the vicinity of the Project Area is high due to the presence of shallow groundwater. Shallow groundwater is more susceptible to contamination via pesticide and herbicide application, spills, and other surface sources of contamination. The wide domestic and livestock use of groundwater within the Project Area is indicative of a potable water supply.

4.2.4 Springs

Springs occur where groundwater discharges to the surface. Mazor (1990) reported that the fractured zones in the Casper Aquifer tend to have large transmissivities (the volume of water flowing through an aquifer). This hydraulic conductivity results in a local lowering of groundwater heads, and groundwater flows into the fault zones. Groundwater then moves upward through the fault planes and it is expressed as surface springs. Springs with substantial flow can serve as the headwaters for streams and rivers and can provide important or unique habitat conditions for aquatic species and other wildlife.

As shown on Figures 8-1 to 8-4, there are five mapped springs within the Project Area, and another nine located within approximately 1 mile of the Project Area. These springs are located primarily along the southern and western portions of the Project Area (USGS 2019; WSGS 2013). In addition, several possible spring-fed wetland and stream systems were identified within the Project Area during the field reconnaissance. The presence of these springs is indicative of the shallow water table and artesian groundwater flow conditions within the Project Area, as noted above.

5 FIELD RECONNAISANCE RESULTS

5.1 Wetlands

A total of 58 potential wetland features were mapped within the Siting Corridor during the September 2019 field reconnaissance, including 40 PEM, ten PSS, and eight PEM/PSS wetlands. Table 4 illustrates the acreage of each feature within the Siting Corridor, and Figures 9-1 to 9-12 depict the boundaries of each feature within the Siting Corridor. Representative photographs of PEM, PSS, and PEM/PSS wetlands are provided as Photos 5-8 in Appendix A.

Table 4: Mapped Wetland Features Within the Siting Corridor

Wetland ID	Cowardin Type[1]	Acreage	Figure #
W-RLST-01 (Government Creek)	PEM	0.07	9-1
W-RLST-02 (Government Creek)	PEM	0.12	9-1

Wetland ID	Cowardin Type[1]	Acreage	Figure #
W-RLST-03 (Government Creek)	PEM	0.01	9-1
W-RLST-04 (Government Creek)	PEM	0.26	9-1
W-RLST-05	PEM	0.24	9-1
W-RLST-06	PEM	0.03	9-1
W-RLST-07	PEM	0.31	9-1
W-RLST-08	PEM	0.12	9-1
W-RLST-09 (Boulder Creek)	PEM	0.10	9-2
W-RLST-10 (Boulder Creek)	PEM	0.22	9-2
W-RLST-11	PEM	0.31	9-3
W-RLST-12 (Willow Creek)	PEM	0.92	9-3
W-RLST-13 (Willow Creek)	PSS	0.21	9-3
W-RLST-14	PEM	0.58	9-3
W-RLST-15	PEM	0.10	9-3
W-RLST-16	PEM	0.29	9-3
W-RLST-17	PEM	1.05	9-3
W-RLST-18	PEM	0.29	9-3
W-RLST-19	PEM	0.10	9-3
W-RLST-20	PEM	2.14	9-3
W-RLST-21 (Willow Creek)	PEM	0.87	9-3
W-RLST-21 Continued (Willow Creek)	PEM/PSS	7.47	9-4
W-RLST-22	PEM	0.13	9-4
W-RLST-23 (Fish Creek)	PEM	1.69	9-4
W-RLST-24	PEM	0.28	9-5
W-RLST-25	PEM	0.48	9-5
W-RLST-26	PEM	0.11	9-5
W-RLST-27 (Fish Creek)	PEM/PSS	3.38	9-4
W-RLST-28	PEM	0.04	9-5
W-RLST-29	PEM/PSS	0.29	9-5
W-RLST-30 (Fish Creek)	PSS	1.00	9-5
W-RLST-31	PEM	0.19	9-9
W-RLST-32	PEM	0.94	9-4
W-RLST-33	PEM	0.39	9-4
W-RLST-34 (Johnson Creek)	PSS	1.48	9-12
W-RLST-35 (Johnson Creek)	PEM	10.36	9-8
W-RLST-36	PEM	0.11	9-8
W-RLST-37	PSS	0.11	9-7
W-RLST-38	PSS	1.42	9-7
W-RLST-39	PEM	0.44	9-7
W-RLST-40	PEM	0.38	9-7
W-RLST-40 Continued	PEM	0.68	9-7
W-RLST-41	PEM	1.40	9-4
W-RLST-42	PEM	0.36	9-4
W-RLST-43 (Dry Creek)	PEM	0.28	9-4
W-RLST-44	PEM/PSS	0.10	9-10

Wetland ID	Cowardin Type[1]	Acreage	Figure #
W-RLST-45	PEM/PSS	5.33	9-11
W-RLST-46	PEM	0.15	9-11
W-RLST-47	PEM	0.06	9-11
W-RLST-48	PSS	0.02	9-11
W-RLST-49 (Pump Creek)	PEM/PSS	0.49	9-11
W-RLST-50	PSS	1.14	9-11
W-RLST-51 (Pump Creek)	PEM/PSS	0.35	9-11
W-RLST-52	PEM	2.91	9-11
W-RLST-53	PEM/PSS	7.83	9-11
W-RLST-54 (Pump Creek)	PSS	0.15	9-10
W-RLST-55 (Pump Creek)	PEM	0.09	9-6
W-RLST-56 (Pump Creek)	PEM	0.71	9-10
W-RLST-57 (Pump Creek)	PSS	5.18	9-10
W-RLST-58 (Pump Creek)	PSS	1.41	9-10

1 PEM = Palustrine Emergent, PSS = Palustrine Scrub/Shrub

The majority of the mapped wetland features are associated with the major named streams and associated tributaries present throughout the Siting Corridor. Herbaceous PEM wetlands made up the majority of wetland features within the Siting Corridor, with PEM/PSS and PSS wetlands focused predominantly within the southern and northeastern portions of the Siting Corridor. No forested wetlands were identified during the site reconnaissance. Dominant herbaceous species included sedges (e.g., *Carex aquatilis* and *C. nebrascensis*), rushes (e.g., *Juncus balticus*), and spikerushes (e.g., *Eleocharis palustris*). Dominant scrub/shrub vegetation included Bebb willow (*Salix bebbiana*), mountain willow (*S. monticola*), and strapleaf willow (*S. eriocephala*).

5.1.1 Fens

During the field reconnaissance effort, a number of mapped PEM wetland locations (WL-RLST-17, WL-RLST-22, WL-RLST-35, WL-RLST-36, and WL-RLST-42) also appeared to display characteristics consistent with fen wetlands (Photos 13-14, Appendix A). Fen wetlands are peat-forming wetland ecosystems that depend on groundwater for a significant portion of their annual water budget (i.e., greater than 66 percent). Fens may be positioned anywhere on a landscape where groundwater emanates, such as on or at the toe of a slope, or in an otherwise flat area with a very high groundwater table. Fens tend to develop and accumulate peat over long periods of time, and their soils have significant total organic carbon content. The Region 6 USFWS definition of a fen includes soil characteristics. Fens, or “peatlands” are defined as having Histosols or a Histic Epipedon in at least some part of a contiguous wetland (USFWS 1999), both of which are comprised of organic soil material.

Organic soil material is defined as soil materials that are saturated with water for long periods and “have organic carbon contents (by weight) of 12 to 18 percent or more, depending on the clay content of the soil. These materials include muck (sapric soil material), mucky peat (hemic soil

material), and peat (fibric soil material)" (USDA 2018). Fens in USFWS Region 6 also normally have pH's above 5.5 and are dominated by grasses, sedges, or willows (UFWS 1999).

Because of the "unique and irreplaceable" characteristics of these systems, the USFWS Region 6 considers fen habitat as "Resource Category 1" with a mitigation goal of "no loss of existing habitat value" (USFWS 1999).

During the field reconnaissance, the potential fen wetlands identified above all exhibited a water table at or just below the ground surface or obvious springs or seeps emanating into the feature. In addition, each was dominated by sedges and grasses with a component of moss development, and each had peat development in the soil, as evidenced by shovel testing. Further soil and groundwater analyses would be required at these features in order to confirm the presence of fen characteristics, as outlined by the USFWS Region 6 Regional Policy on the Protection of Fens (USFWS 1999).

5.2 Other Waterbodies

5.2.1 Streams

A total of 53 stream features were mapped within the Siting Corridor during the September 2019 field reconnaissance, including 45 ephemeral, 5 intermittent, and 3 perennial streams. Table 5 illustrates the linear feet of each feature within the Siting Corridor, and Figures 9-1 to 9-12 depict the location of each feature within the Siting Corridor. Representative photographs of each stream type are provided as Photos 9 through 11 in Appendix A.

Table 5: Mapped Stream Features Within the Siting Corridor

Stream ID	Flow Regime[1]	Length (Linear Feet)	Figure #
S-RLST-01 (Government Creek)	Intermittent	0.00	9-1
S-RLST-02 (Forest Creek)	Intermittent	3782.26	9-1
S-RLST-03	Ephemeral	1651.79	9-1
S-RLST-04	Ephemeral	184.61	9-1
S-RLST-05	Ephemeral	200.90	9-2
S-RLST-06	Ephemeral	2328.55	9-2
S-RLST-06 Continued	Ephemeral	17.98	9-1
S-RLST-07	Ephemeral	323.15	9-4
S-RLST-08	Ephemeral	1165.82	9-3
S-RLST-09	Ephemeral	999.15	9-3
S-RLST-10	Ephemeral	1903.43	9-3
S-RLST-11	Ephemeral	159.04	9-4
S-RLST-12	Ephemeral	823.52	9-4
S-RLST-13	Ephemeral	315.19	9-5
S-RLST-14	Ephemeral	728.34	9-5
S-RLST-15	Ephemeral	537.17	9-5
S-RLST-16	Ephemeral	1073.02	9-5

Stream ID	Flow Regime[1]	Length (Linear Feet)	Figure #
S-RLST-17	Ephemeral	844.75	9-4
S-RLST-18	Ephemeral	1204.94	9-4
S-RLST-19	Ephemeral	293.15	9-4
S-RLST-19 Continued	Ephemeral	703.66	9-4
S-RLST-20	Ephemeral	192.59	9-4
S-RLST-21	Ephemeral	141.85	9-5
S-RLST-22	Ephemeral	1089.01	9-4
S-RLST-23	Ephemeral	422.03	9-4
S-RLST-24	Perennial	1353.42	9-9
S-RLST-25	Ephemeral	454.42	9-8
S-RLST-26	Ephemeral	715.95	9-4
S-RLST-27	Ephemeral	317.30	9-4
S-RLST-27-Tributary-North	Ephemeral	238.84	9-4
S-RLST-27-Tributary-South	Ephemeral	578.17	9-4
S-RLST-28	Ephemeral	306.23	9-4
S-RLST-29	Ephemeral	1214.03	9-3
S-RLST-30	Ephemeral	314.22	9-3
S-RLST-31	Ephemeral	252.35	9-7
S-RLST-32	Intermittent	113.25	9-7
S-RLST-33	Ephemeral	290.81	9-7
S-RLST-34	Ephemeral	192.39	9-7
S-RLST-35	Ephemeral	1120.95	9-8
S-RLST-36 (Johnson Creek)	Ephemeral	558.73	9-8
S-RLST-37	Ephemeral	635.55	9-8
S-RLST-38	Ephemeral	102.76	9-8
S-RLST-39	Ephemeral	4.03	9-8
S-RLST-40	Ephemeral	451.43	9-8
S-RLST-40 Continued	Ephemeral	1998.97	9-8
S-RLST-41	Ephemeral	469.28	9-8
S-RLST-42	Ephemeral	246.53	9-8
S-RLST-43 (Pump Creek)	Perennial	553.43	9-11
S-RLST-44 (Dale Creek)	Perennial	211.98	9-7
S-RLST-45	Ephemeral	1205.02	9-11
S-RLST-46	Ephemeral	218.19	9-11
S-RLST-47	Intermittent	105.01	9-11
S-RLST-48	Intermittent	40.11	9-11
S-RLST-49	Ephemeral	103.54	9-6
S-RLST-50	Ephemeral	780.59	9-6
S-RLST-51	Ephemeral	1057.20	9-6
S-RLST-52	Ephemeral	778.89	9-6
S-RLST-53	Ephemeral	130.83	9-7

1 Ephemeral: flows briefly in direct response to precipitation; Intermittent: flows continuously only at certain times of the year (i.e., seasonal); Perennial: flows year-round

The majority of the mapped stream features are reflective of the numerous ephemeral tributaries associated with the major named streams present throughout the Siting Corridor. In general, intermittent and perennial stream features within the Siting Corridor were captured within the larger boundaries of their associated wetlands as listed above. In general, streams identified during the field reconnaissance were typical of the mountainous high plains of Wyoming and its low base flow and rainfall-driven streamflow.

5.2.2 Ponds

Four ponds were mapped within the Siting Corridor during the September 2019 field reconnaissance. Table 6 lists the acreage of each pond within the Siting Corridor, and Figures 9-1 to 9-12 depict the location of each pond. A representative photograph of a pond identified within the Siting Corridor is provided as Photo 12 in Appendix A.

All four mapped ponds are man-made stock ponds excavated within larger drainages and are reflective of agricultural manipulation of drainage features within the region.

Table 6: Mapped Pond Features Within the Siting Corridor

Pond ID	Type	Acreage	Figure #
POND-RLST-01 (Government Creek)	Open Water	0.01	9-1
POND-RLST-02 (Government Creek)	Open Water	0.65	9-1
POND-RLST-03 (Forest Creek)	Open Water	1.16	9-1
POND-RLST-04	Open Water	0.22	9-4

5.3 Uplands

Upland data points were taken at all locations identified by the NHD or NWI as potential streams or wetlands that were ultimately determined not to support wetland or other waterbody features. These features lacked the following: hydrophytic vegetation; a defined bed and bank or scour condition; other observable OHWM features.

A total of 89 swale points and five upland points were mapped during the field reconnaissance as illustrated in Figures 9-1 to 9-12. Representative photographs of swale and upland points identified within the Siting Corridor are provided as Photos 15 and 16 in Appendix A.

Swales were defined as curvilinear low areas of topography that tend to gather and focus sheet flows from uplands during precipitation events but lack definable stream beds and banks and do not have observable OHWMs. They tend to be located high in watersheds. While these features would not be considered jurisdictional WOTUS, they have the potential to hold ponded water or flowing water after significant rain or snow events.

6 POTENTIAL EFFECTS ANALYSIS

This section discusses the potential direct and indirect effects to surface water and groundwater resources associated with the Project, as well as any Environmental Protection Measures (EPMs), as outlined in Table 9 below, that are proposed by ConnectGen to avoid or reduce potential impacts to these resources.

6.1 Surface Water

6.1.1 Surface Water Quality

Potential impacts to surface water quality from Project construction or operation would occur if contamination of surface water from erosion or stormwater runoff resulted in a violation of water quality standards, impacts to human use or use by aquatic species, or offsite erosion and downstream ecosystem impacts due to alteration of existing drainage patterns.

As outlined in Table 9 below, a Stormwater Pollution Prevention Plan (SWPPP) outlining specific erosion control measures will be prepared in accordance with federal and state requirements to reduce potential onsite or downstream impacts to surface water resources from erosion and sedimentation associated with construction activities. Construction activities will be conducted to contain potential spills and avoid introduction of potential hazardous materials or other pollutants into surface waters. Erosion control barriers and other measures, such as silt fencing, fiber logs, and/or hay bales will be placed immediately upgradient of surface water resources to minimize sediment transport and deposition.

A Surface Waters Assessment Report conducted for the Hermosa West Wind Energy Project (ERM 2010) noted an erodibility risk of low to medium for all stream segments within the project. The study noted that, while the watershed associated with the project was not expected to contribute marked changes in sediment load due to development of the project, impacts to stream channel carrying capacity and morphology due to construction of road crossings was possible. In addition, in a WGFD scoping response letter to WAPA received January 29, 2020, WGFD recommended that an RLA be completed for the Harney Creek-Laramie River sub-basin to determine potential downstream aquatic impacts to Species of Greatest Conservation Need within the sub-basin. Similar to the Surface Waters Assessment Report completed for the Hermosa West Wind Energy Project, this RLA will provide information on erodibility risk of surface water resources within the sub-basin.

Based on the recommendations of WGFD, upon identification of final design ConnectGen will conduct an RLA or similar method for the portion of the Project that occurs within the Harney Creek-Laramie River sub-basin to determine the potential for any Project impacts to aquatic resources within this sub-basin. As outlined in Table 9 below, in order to avoid potential downstream onsite and downstream impacts to aquatic resources, access roads will be designed and constructed to minimize disruption of natural drainage patterns including perennial, intermittent, and ephemeral streams. Waterbody crossings will incorporate WGFD design specifications and professional engineering standards as applicable. Open-bottom culverts will be used where appropriate to avoid changing stream morphology or removing suitable fish

habitat. In addition, such waterbody crossings and culverts will be constructed in a manner that prevents sediment erosion, deposition of sediment, and minimizes impacts to any environmentally sensitive areas. Water quality BMPs will be implemented at waterbody crossings to minimize any unforeseen impacts to the Platte River System's watershed and associated vegetation communities.

No groundbreaking activity or in-stream activity will occur during operation of the Project; thus, there are no anticipated impacts to surface water quality associated with operational activities.

6.1.2 Floodplains

Potential impacts to floodplains from Project construction or operation would occur if modification of floodplains from Project development resulted in adverse effects to the flood carrying capacity of the floodplain or the pattern or magnitude of the flood flow, resulting in structural or property damage onsite or offsite.

According to FEMA flood maps, approximately 15.77 acres of 100-year floodplains (1 Percent Annual Chance Flood Hazard) are mapped within the Siting Corridor (Figure 5), and are associated with Pump Creek, Dale Creek, and some of their associated tributaries in the northeast portion of the Siting Corridor.

ConnectGen would microsite Project structures and buildings to avoid floodplains to the extent feasible in accordance with EO 11988. Should the Project require placement of any structures or buildings within a FEMA-designated floodplain, a Floodplain Development Permit would be submitted to Albany County in accordance with the Albany County Flood Damage Prevention Ordinance.

6.1.3 Wetland and Other Waterbody Features

Potential impacts to wetlands and other waterbodies from Project construction or operation could result in impacts to jurisdictional WOTUS that would violate Section 404 of the CWA or other applicable surface water regulations, and/or the indirect loss of wetlands or riparian areas caused by degradation of water quality, diversion of water sources, or erosion and sedimentation resulting from altered drainage patterns.

As outlined in Section 5.1, 58 potential wetland features were mapped within the Siting Corridor during the September 2019 field reconnaissance, including 40 PEM, 10 PSS, and 8 PEM/PSS wetlands (Figures 9-1 to 9-12). A total of 57 waterbody features were mapped, including 45 ephemeral streams, 5 intermittent streams, 3 perennial streams, and 4 ponds.

The majority of the mapped stream features are reflective of the numerous ephemeral tributaries associated with the major named streams present throughout the Siting Corridor. The majority of the mapped wetland features and ponds are associated with the major named streams and associated tributaries present throughout the Siting Corridor. In general, intermittent and perennial

stream features within the Siting Corridor were captured within the larger boundaries of their associated wetlands.

As discussed in Section 1.2.2, in order to quantify the potential ground disturbance of the Project, ConnectGen developed a Representative Project Layout (Figure 2) meant to reflect the largest proposed Project footprint (i.e., most conservative for estimate of impacts). Based on the Representative Project Layout, a total of approximately 9.10 acres of wetlands/ponds occur within the representative temporary disturbance footprint and approximately 0.81 acre of wetlands/ponds occur within the representative permanent disturbance footprint. In addition, a total of approximately 7,965.85 linear feet of streams occur within the representative temporary disturbance footprint, and approximately 842.57 linear feet of streams occur within the representative permanent disturbance footprint. Permanent direct effects to wetlands and other waterbodies could result from the construction of access roads and the gen-tie transmission line. Direct short-term habitat loss could occur within areas temporarily disturbed during construction of these Project features as well as construction of crane paths, electrical collection lines, and turbine pads.

Tables 7 and 8 provide a breakdown of acres of wetlands/ponds and linear feet of streams located within the representative temporary and permanent disturbance footprints (based on the Representative Project Layout), and the associated Project component related to the calculated disturbance for each feature. As noted above, these values are meant to reflect the most conservative estimate of potential impacts. Actual temporary and permanent disturbance of wetland and other waterbody features are anticipated to be lower than these estimates as ConnectGen continues to refine siting of Project features based on the results of this assessment and subsequent delineations.

Table 7: Wetlands and Ponds Located within Representative Permanent and Temporary Project Disturbance Footprint

Wetland/Pond ID	Representative Permanent Disturbance Footprint (Acres)1	Project Component	Representative Temporary Disturbance Footprint (Acres)1	Project Component
W-RLST-04	0.0034	Access Road	0.0230	Crane Path, Access Road, Collection Line
W-RLST-05	—	—	0.0687	Collection Line
W-RLST-06	—	—	0.0014	Access Road
W-RLST-08	0.0257	Access Road	0.1167	Access Road
W-RLST-09	—	—	0.0712	Crane Path
W-RLST-10	—	—	0.1426	Collection Line
W-RLST-13	—	—	0.0506	Collection Line
W-RLST-14	0.0058	Access Road	0.0636	Access Road, Collection Line
W-RLST-15	—	—	0.0175	Collection Line
W-RLST-16	—	—	0.1817	Collection Line
W-RLST-18	—	—	0.0544	Collection Line
W-RLST-19	0.0088	Access Road	0.0730	Access Road, Collection Line
W-RLST-21	0.1462	Access Road	0.7124	Access Road
W-RLST-21 Continued	0.0622	Access Road	0.3738	Access Road, Collection Line
W-RLST-23	0.0300	Access Road	0.1629	Access Road, Collection Line
W-RLST-26	—	—	0.0386	Collection Line
W-RLST-27	—	—	0.1105	Collection Line
W-RLST-29	—	—	0.1326	Crane Path
W-RLST-30	—	—	0.0327	Collection Line
W-RLST-32	0.0136	Access Road	0.1024	Access Road, Collection Line
W-RLST-33	0.0035	Access Road	0.0106	Access Road, Collection Line
W-RLST-34	—	—	0.0550	Collection Line
W-RLST-35	0.1973	Access Road	1.5807	Access Road, Collection Line
W-RLST-37	—	—	0.1127	Collection Line
W-RLST-39	0.0633	Access Road	0.1847	Access Road
W-RLST-40	--	--	0.0438	Collection Line
W-RLST-40 Continued	--	--	0.0124	Collection Line
W-RLST-41	0.0135	Access Road	0.1745	Access Road, Collection Line, Turbine Pad

Wetland/Pond ID	Representative Permanent Disturbance Footprint (Acres)1	Project Component	Representative Temporary Disturbance Footprint (Acres)1	Project Component
W-RLST-42	0.0263	Access Road	0.2374	Access Road, Collection Line, Turbine Pad
W-RLST-43	0.0405	Access Road	0.2359	Access Road, Collection Line
W-RLST-44	0.0197	Access Road	0.0922	Access Road, Collection Line
W-RLST-45	—	—	0.0242	Access Road
W-RLST-48	—	—	0.0212	Collection Line
W-RLST-49	—	—	0.1967	Collection Line
W-RLST-50	0.0246	Access Road	0.1430	Access Road
W-RLST-51	0.0503	Access Road	0.3495	Access Road, Collection Line
W-RLST-52	0.0508	Access Road	0.2837	Access Road, Collection Line
W-RLST-53	0.0227	Access Road	1.5869	Crane Path, Access Road, Collection Line
W-RLST-57	—	—	0.6839	Crane Path, Collection Line
POND-RLST-03	—	—	0.5213	Crane Path, Collection Line
POND-RLST-04	0.0007	Access Road	0.0165	Access Road, Collection Line
TOTAL	**0.8090**		**9.0973**	

1 Acreage impacts calculated based on Representative Project Layout.

Table 8: Streams Located within Representative Permanent and Temporary Project Disturbance Footprint

Wetland/Pond ID	Representative Permanent Disturbance Footprint (Linear Feet)1	Project Component	Representative Temporary Disturbance Footprint (Linear Feet)1	Project Component
S-RLST-02	22.94	Access Road	249.18	Access Road, Collection Line
S-RLST-04	—	—	109.58	Collection Line
S-RLST-06	25.41	Access Road	1,065.08	Crane Path, Access Road, Collection Line, Turbine Pad
S-RLST-06 Continued	—	—	24.37	Collection Line
S-RLST-08	20.25	Access Road	265.64	Crane Path, Access Road
S-RLST-09	36.50	Access Road	281.32	Access Road, Collection Line
S-RLST-12	21.90	Access Road	163.39	Access Road, Collection Line
S-RLST-14	—	—	274.31	Crane Path
S-RLST-15	—	—	90.48	Crane Path
S-RLST-16	20.02	Access Road	172.01	Access Road, Collection Line
S-RLST-17	22.09	Access Road	160.06	Access Road, Collection Line
S-RLST-18	20.14	Access Road	153.75	Access Road, Collection Line
S-RLST-19 Continued	26.83	Access Road	121.72	Access Road, Collection Line
S-RLST-20	—	—	56.52	Collection Line
S-RLST-21	23.19	Access Road	136.99	Access Road
S-RLST-22	20.47	Access Road	159.74	Access Road, Collection Line
S-RLST-24	—	—	139.92	Crane Path
S-RLST-26	20.95	Access Road	163.19	Access Road, Collection Line
S-RLST-27	20.67	Transmission Line	108.42	Transmission Line
S-RLST-27-Tributary-North	22.87	Transmission Line	125.44	Transmission Line
S-RLST-27-Tributary-South	103.41	Transmission Line	369.90	Transmission Line
S-RLST-28	21.31	Transmission Line	105.01	Transmission Line
S-RLST-29	23.45	Access Road	175.42	Access Road, Collection Line
S-RLST-32	21.20	Access Road	113.53	Access Road
S-RLST-33	—	—	293.92	Collection Line
S-RLST-34	—	—	194.43	Crane Path, Collection Line
S-RLST-35	22.17	Access Road	428.36	Access Road, Collection Line, Turbine Pad
S-RLST-38	—	—	102.93	Crane Path

Wetland/Pond ID	Representative Permanent Disturbance Footprint (Linear Feet)1	Project Component	Representative Temporary Disturbance Footprint (Linear Feet)1	Project Component
S-RLST-40	26.20	Transmission Line	130.64	Transmission Line
S-RLST-40 Continued	169.50	Access Road, Transmission Line	523.57	Access Road, Collection Line, Transmission Line
S-RLST-41	0.96	Access Road	41.58	Access Road, Collection Line
S-RLST-42	20.03	Transmission Line	103.42	Transmission Line
S-RLST-43	—	—	108.01	Crane Path
S-RLST-44	—	—	206.77	Collection Line
S-RLST-45	29.35	Access Road	198.10	Access Road, Collection Line
S-RLST-46	20.06	Access Road	156.35	Access Road, Collection Line
S-RLST-49	20.05	Access Road	101.82	Access Road
S-RLST-50	20.21	Access Road	158.27	Access Road, Collection Line
S-RLST-51	20.46	Access Road	154.56	Access Road, Collection Line
S-RLST-52	—	—	145.16	Collection Line
S-RLST-53	—	—	133.01	Crane Path, Collection Line
TOTAL	**842.57**		**7,965.86**	

1 Linear feet impacts calculated based on Representative Project Layout.

As noted above in Section 2.1.2, all discharges of dredged or fill material that result in permanent or temporary losses of jurisdictional WOTUS are regulated by USACE under Section 404 of the CWA. The finalization of the Navigable Waters Protection Rule on January 23, 2020, provides four specific categories of waters that are federally regulated under the CWA, and would be considered jurisdictional WOTUS:

1. Territorial seas and TNWs
2. Perennial and intermittent tributaries to territorial seas and navigable waters
3. Certain lakes, ponds and impoundments of jurisdictional waters
4. Wetlands adjacent to other jurisdictional waters

The final rule also identifies waters/features that are not considered jurisdictional WOTUS, including ephemeral features, many farm and roadside ditches, and artificial lakes and ponds. The new rule is scheduled to go into effect 60 days after publication in the Federal Register; however, implementation of the rule may be delayed by legal challenges.

A jurisdictional determination has not been completed by USACE or EPA for wetland and other WOTUS features within the Siting Corridor; however, based on field observation and the location of the Project Area within the Laramie River-Harney Creek and Dale Creek sub-basins, it appears most of these features are associated with drainage systems that have direct hydrologic connections downstream to the North or South Platte Rivers, which are both considered TNWs. As a result, surface water features identified within the Siting Corridor may be considered jurisdictional WOTUS subject to regulation under Section 404 of the CWA. However, based on the guidance provided by the final rule, a number of the features identified during the September 2019 field reconnaissance, namely ephemeral streams and ponds, may not be considered jurisdictional WOTUS subject to regulation under Section 404 of the CWA. This determination can only be made through a jurisdictional determination from the USACE or EPA.

A formal WOTUS delineation would be completed prior to construction to support final design and determine permitting requirements. Based on this information, ConnectGen would complete any further micrositing of Project features during the final design phase to avoid, prevent, or minimize potential impacts to jurisdictional WOTUS to the extent feasible in accordance with CWA Section 404 and EO 11990. A PCN may be needed to address the minimization of effects, restoration of temporarily disturbed wetlands and waterbodies, and mitigation for permanent impacts. Verification of the NWP may also require compliance with all applicable NWP General Conditions and Regional Conditions for Wyoming as issued by the USACE Omaha District.

Based on the representative permanent wetland/pond impacts of approximately 0.81 acre, neither a General Permit for Wetland Mitigation nor a notification to WDEQ under the Wyoming Wetlands Act would be anticipated for Project development.

In addition to securing all appropriate state and federal permits as outlined in Table 9 below, ConnectGen plans to avoid and/or minimize adverse effects to wetlands and waterbodies through conservation of woody material, restricted use of equipment, and use of wooden construction

matting within disturbed wetlands. Wetland and aquatic resource boundaries would be clearly identified on all construction plans and would be posted with signs and flagging in the field. No parking or servicing of construction-related vehicles would occur within any wetland boundary. In addition, erosion control barriers and other measures, such as silt fencing, fiber logs, and/or hay bales would be placed immediately upgradient of wetlands and waterbodies to minimize sediment transport and deposition.

6.1.3.1 Fens

As noted above, during the field reconnaissance effort, a number of mapped PEM wetland locations also appeared to display characteristics consistent with fen wetlands. Because of the "unique and irreplaceable" characteristics of these systems, the USFWS Region 6 considers fen habitat as "Resource Category 1" with a mitigation goal of "no loss of existing habitat value" (USFWS 1999). In addition, as part of the Regional Conditions for the State of Wyoming, the USACE Omaha District requires that permittees notify the Wyoming Regulatory Office in accordance with General Condition Number 32 (PCN) prior to undertaking any authorized activities in wetlands classified as peatland (e.g., fens). The Project would seek to avoid adverse impacts to fens in the final design, construction, and operation of the facility. If impacts to fens cannot be avoided, the Project would coordinate with the appropriate regulatory authority to identify additional avoidance or minimization measures that may be applicable.

6.2 Groundwater

Potential impacts to groundwater resources from Project construction or operation would occur if degradation of groundwater resulted in a violation of water quality standards and/or groundwater depletions or interference with groundwater recharge resulted in adverse effects to local or downstream aquifers.

The Project would require the following components that could have impacts to groundwater:

1. A permanent potable water well used to supply the O&M building.
2. Temporary water wells or haul water used for the concrete batch plant and dust control during construction activities.
3. Construction of turbine foundations. Two foundation designs are typically used for wind turbine installations in the U.S.; the specific foundation used for individual turbine locations would be determined by the soil conditions and wind turbine requirements. The first foundation type is a "mat" foundation. The second foundation type is a "pier" foundation. Mat foundations are wide and shallow, and pier foundations are narrow and deep. Mat foundations are typically 60- to 80-foot-diameter octagons with an approximate depth of 10 to 12 feet. Pier foundations are typically 15 to 18 feet in diameter with an approximate depth of 30 to 40 feet. There are variations of these foundations, and the exact foundation type to be used cannot be determined until a final turbine type is chosen and a detailed geotechnical investigation is completed. Due to the expected soil conditions in the Project Area, the Project would most likely use the "mat" foundation type.

6.2.1 Groundwater Use and Depletions

As noted above, water use during construction would include applications for turbine foundation backfill, dust control, and concrete. Once the Project is operational, primary water use would occur at the O&M building.

A water supply and yield analysis has not been conducted for the Project, but is planned prior to review and approval by the ISC. However, it is conservatively anticipated that the volume of water required for construction of the Project would not exceed 200 acre-feet over the course of an 18-month construction period. The exact geological source for this water has not yet been determined, and there are several possible sources. Water used for Project construction would likely to be obtained from either temporary groundwater wells or from an offsite water purveyor. During Project operations, only minimal daily water use would be required to support onsite staff at the O&M building, and would be anticipated to be supplied by either an existing landowner well or a new domestic on-site well.

The Project Area is located within the Platte River Basin, which is the major hydrologic basin from which water would be appropriated for use for Project construction and operation. Under Section 7 of the ESA, consultation must occur for projects in Wyoming that may lead to water depletions that potentially impact water quality in the Platte River System, as adverse impacts to water quality may affect threatened and endangered species inhabiting the downstream reaches of these river systems. These activities include new or expanded wells, reservoirs, or diversions whose water supply is solely derived from sources that are considered “hydrologically connected” to surface water associated with the Platte River and that meet or exceed the de minimis threshold of 0.1 acre-foot per year of depletions in flow to the nearest surface water tributary to the Platte River System.

As estimated water use for the Project is minimal, it is anticipated that any water-related activities associated with the Project will be covered under the Wyoming Depletions Plan and will be subject to streamlined ESA consultation with USFWS for review of impacts to the Platte River System. Any new wells utilized for construction or operation of the Project that do not have an existing senior water right would be developed in accordance with the Wyoming SEO.

In addition, according to the Wyoming SEO “Green Area” maps, groundwater resources associated with the Harney Creek-Laramie River sub-basin, which covers the northwestern portion of the Project Area (Figure 1) are considered “not hydrologically connected” to the North Platte River Basin (WSGS 2013). Therefore, development of new water supply wells or use of existing water sources within this portion of the Project would be unlikely to require coverage under the PRRIP.

Utilization of existing wells for Project water needs would be appropriated in accordance with a Wyoming SEO Temporary Water Use Agreement. A Permit to Appropriate Ground Water would be obtained by the Wyoming SEO prior to development of any new water supply wells. As outlined in Table 9 below, if new groundwater wells are required for construction or operation, the Project

would coordinate with the Wyoming SEO State Engineer to ensure withdrawal volumes would not adversely affect supplies for other uses.

As noted in Section 2.2.6, if an applicant for an ISC Permit plans to construct a facility that will use more than 800 acre-feet (260.7 million gallons) of water per year, the applicants must submit a water supply and water yield analysis to the Wyoming SEO. Although construction water balance calculations have not yet been completed for the Project, it is anticipated that the Project would not exceed the 800 acre-feet per year threshold, and therefore would not require a Wyoming SEO water supply yield analysis or opinion.

6.2.1.1 Dewatering

As noted in Figures 8-1 to 8-4, the majority of groundwater wells within the Project Area have a static water depth of 10 feet or less, indicating the presence of shallow groundwater within the Project Area in response to localized confined conditions. In addition, the mapped depth to groundwater levels illustrated in Figures 8-1 to 8-4 depict an area of shallow groundwater depth (0 to 10 feet bgs) in the northeastern portion of the Project Area, with depths of 10 to 20 feet bgs present within the majority of the southern and western portions of the Project Area. Actual depths to groundwater within the Siting Corridor likely vary greatly based on topography and other site-specific geography.

Previous geotechnical studies conducted within the Project Area for the Hermosa West Wind Energy Project found that of the 12 boring locations taken during geotechnical studies conducted within the western portion of the Project Area, only two encountered groundwater—one at a depth of 27.5 bgs, and one at a depth of 28 feet bgs (Black & Veatch 2009, 2010). Geotechnical studies have not been conducted for the eastern portion of the Project Area.

As noted above, turbine foundations are anticipated to be excavated to a depth of 10 to 12 feet or 30 to 40 feet, depending on the turbine type and associated foundation selected for the Project. Based on the groundwater depth information provided above, it is possible that dewatering may be required for excavation of some turbine foundations, namely those located within the northeastern portion of the Siting Corridor. As part of the geotechnical investigation for the Project, the depth and strength of the subsurface soil structures, including groundwater depth and characteristics, would need to be investigated in order to determine dynamic properties for the individual turbine foundation designs. The investigation would consist of taking coring samples up to 40 feet deep at specific locations along the turbine strings using geotechnical drilling equipment mounted to either a truck or tracked vehicle. The coring process would provide samples that would be logged, and discrete samples would be collected for laboratory strength testing. The results of these studies would inform appropriate siting of turbines to minimize and avoid potential impacts to groundwater to the extent practicable.

While a specific dewatering process has not yet been identified, it is anticipated that any dewatering that may be required for turbine construction would be completed utilizing techniques and best practices to avoid or minimize impacts. Prior to construction a Dewatering Plan would

be developed that will more specifically identify appropriate construction dewatering practices for the site conditions, such as sock tile trenching and/or a wellpoint system. The sock tile trenching system is comprised of fabric-wrapped perforated pipe installed under the construction area by a specialized trencher. Individual runs of pipe are then collected in a common pipe header for connection to a wellpoint pump which draws out groundwater. The wellpoint system is comprised of a series of small diameter wells (wellpoints) connected via a header pipe to a pump which draws out groundwater. Any groundwater extracted as part of dewatering would be discharged to a temporary sediment basin or other containment method before being discharged within the same drainage basin via a nearby surface water feature. Dissipation methods would be utilized in areas where the dewatering outlet may cause scour in the downstream conditions.

For locations where siting of turbine foundations may require dewatering, ConnectGen would obtain a Temporary Discharge Permit from WDEQ as part of coverage under the WYPDES large and small construction stormwater permits to cover construction dewatering. WDEQ reviews each request for coverage before authorizing discharge under this permit to identify any exceptional situations where an individual permit may be needed, or for areas where additional monitoring maybe required for groundwater quality. Discharges that have a significant groundwater component and that are pumped or siphoned to a storm drain or may reach a surface water of the state, directly or by overland flow, are considered a process wastewater and must be covered under a separate WYPDES permit for wastewater discharges.

All necessary dewatering activities would be conducted in accordance with WDEQ to avoid adverse impacts to surface water and groundwater resources, including recharge or discharge of groundwater in a downgradient or deep aquifer or downstream impacts to the Platte River Basin.

6.2.2 Groundwater Quality

The Late-Paleozoic Aquifer, which comprises the northwestern portion of the Project Area (Figure 7), is considered a part of the Casper Aquifer, which consists of saturated and permeable parts of the Permian and Pennsylvanian Casper Formation, and where present, saturated and permeable parts of the underlying Pennsylvanian Fountain Formation (WSGS 2013). In order to protect drinking water within the Casper Aquifer from potential contamination, the City of Laramie has developed the Casper Aquifer Protection Plan, which identifies an approximately 72-square-mile portion of the Casper Aquifer as the Casper Aquifer Protection Area (CAPA) and identified management strategies to protect the aquifer from existing and future contamination (CAPP 2008). The Project Area lies approximately 6 miles south of the CAPA, and thus would not be subject to any zoning regulations identified within the CAPA.

The Project Area is located in an area mapped with high aquifer sensitivity (WSGS 2013). In general, the aquifer sensitivity in the vicinity of the Project Area is high due to the presence of shallow groundwater, which is more susceptible to contamination via pesticide and herbicide application, spills, and other surface sources of contamination.

As outlined in Table 9 below, construction activities will be conducted to contain potential spills and avoid introduction of potential hazardous materials or other pollutants into the groundwater through proper storage and handling. Trained spill containment crews will respond to accidental releases as described in Health and Safety Plans developed for the Project, and a Spill Prevention Control and Countermeasure Plan will be onsite during construction, operation, and maintenance that defines procedures for storage, cleanup and disposal of petroleum-based products.

6.2.3 Springs

As shown on Figures 8-1 to 8-4, there are five mapped springs within the Project Area, and another nine located within approximately 1 mile of the Project Area. In addition, there were several identifications of possible spring-fed wetland and stream systems identified within the Project Area during the field reconnaissance. The presence of these springs is indicative of the shallow water table and artesian groundwater flow conditions within the Project Area.

Because of the unique habitat characteristics of these features, as part of the Regional Conditions for the State of Wyoming the USACE Omaha District requires that permittees notify the Wyoming Regulatory Office in accordance with General Condition Number 32 (PCN) prior to undertaking any authorized activities within 100 feet of the water source in natural spring areas. Project components would be microsited to avoid impacts within 100 feet of all mapped springs and any others later identified in the field.

6.3 Applicant-Proposed Environmental Protection Measures

ConnectGen has developed EPMs that when implemented would avoid or minimize adverse effects to environmental resources from construction, operations and maintenance, and decommissioning of the Project. The EPMs listed in Table 9 below would both directly and indirectly avoid or reduce potential impacts to surface water and groundwater resources from development of the Project.

Table 9: Proposed Environmental Protection Measures Related to Surface Water and Groundwater Resources for the Rail Tie Wind Project

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
General					
GEN-1	The Project will be designed, constructed, and operated in compliance with Albany County Zoning Regulations (as amended) and Albany County Wind Energy Siting Regulations. Construction and operations activities will comply with all federal, state, and county environmental regulations, as applicable.	X	X	X	X
GEN-2	The Project will delineate environmentally sensitive areas (e.g. wetlands, waters, habitats) located within or adjacent to the Project Area and will identify those locations in construction planning documents. Construction and operations personnel will be informed of the appropriate practices that may be applicable to avoid or minimize impacts to these areas.	X	X	X	X
GEN-3	Construction travel will be restricted to existing roads and permanent or temporary access roads identified in the final Project Site Plan.		X		
GEN-8	Temporary sanitary facilities will be located in convenient locations throughout the site. Facilities will be located greater than 100 feet from any waterbody or wetland and will be regularly serviced and maintained.		X		X
Geology and Soils					
GEO-1	Temporary ground disturbance activities will be limited to the minimum amount necessary in order to safely construct Project facilities.		X		
GEO-2	Ground disturbance activities in areas of highly erodible soils and steep slopes will be avoided to the extent practicable.		X		
GEO-3	Roads will be designed to follow existing contours and to avoid steep slopes that would require extensive cut-and-fill construction.	X			
GEO-5	An Erosion Control Plan (ECP) will be developed to identify areas of potentially higher erodibility due to excavation, grading, or ground disturbance. The ECP will define appropriate erosion control measures that may be implemented during and after construction.		X		

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
GEO-6	Erosion control measures will be periodically inspected, and as required after precipitation events. Erosion control measures will be repaired or replaced as necessary.		X		
GEO-7	As soon as practicable following completion of ground disturbance activities, areas of temporary ground disturbance will be regraded and recontoured to blend with the natural terrain while maintaining existing drainage patterns.		X	X	X
GEO-8	All private landowner's existing drainage and erosion control structures such as diversions, irrigation ditches and tile lines shall be avoided by the Project, or in the alternative, appropriate measures are to be taken to maintain the design and effectiveness of the existing structures. Any structures disturbed during construction shall be repaired to as close to original condition as possible, as soon as possible.		X		
Vegetation					
VEG-1	A Reclamation Plan will be prepared prior to the onset of construction that will guide the revegetation of disturbed areas during and following the construction process.	X	X		
VEG-2	Revegetation will be implemented for all areas temporarily disturbed by construction or decommissioning of the facility in conformance with landowner agreements and in compliance with state and/or federal permitting requirements. Temporarily disturbed areas will be revegetated as soon as practicable, either through natural revegetation practices or through the use of reseeding. Plant species native to the affected ecosystems will be utilized whenever practicable.		X		X
VEG-3	The Reclamation Plan will identify locally-approved, weed free, seed mixtures that prioritize plant species native to the ecosystems affected by site construction.	X	X		
VEG-8	Any herbicide use as part of vegetation management activities will follow label instructions and relevant federal, state, and local laws.		X	X	X
Water Quality					
WQ-1	The Project will identify, avoid, and/or minimize adverse effects to wetlands and waterbodies.	X	X	X	X
WQ-2	Woody vegetation in potentially disturbed wetlands will be cut at ground level to leave the root systems intact and encourage sprouting of the existing species following construction.		X		

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
WQ-3	Equipment operation in wetlands will be kept to the minimum necessary to safely perform the work. Prefabricated equipment matting will be used to avoid rutting, soil compaction, and other ground disturbance where temporary work areas occur in wetlands.		X		X
WQ-4	Wetland and aquatic resource boundaries will be clearly identified on all construction plans and will be posted with signs and flagging in the field.		X		X
WQ-5	Appropriate permits will be secured prior to any fill or dredge activities in wetlands or other waters of the United States (WOTUS).	X	X	X	X
WQ-5	No parking or servicing of construction-related vehicles will occur within any wetland boundary.		X	X	X
WQ-6	Erosion control barriers and other measures, such as silt fencing, fiber logs, and/or hay bales will be placed immediately upgradient of wetlands and waterbodies to minimize sediment transport and deposition.		X		X
WQ-7	Access roads will be designed and constructed to minimize disruption of natural drainage patterns including perennial, intermittent, and ephemeral streams.	X	X		
WQ-8	A Stormwater Pollution Prevention Plan (SWPPP) outlining specific erosion control measures will be prepared, and its requirements will be implemented onsite for the proposed Project. The SWPPP will be based on EPA and WYDEQ requirements.	X	X		
WQ-9	Construction activities shall be performed using methods that prevent entrance or accidental spillage of solid matter, contaminant debris, and other objectionable pollutants and wastes into flowing streams or dry watercourses, lakes, and underground water sources.		X		
WQ-10	Borrow pits, if required, shall be excavated so that the water will not collect and stand therein. Upon completion of construction, the sides of borrow pits will be brought to stable slopes, with slope intersections shaped to carry the natural contour of adjacent, undisturbed terrain into the pit or borrow area, giving a natural appearance.		X		

Resource Category	Measure	Implementation			
		Preconstruction	Construction	Operations	Decommissioning
WQ-11	Waterbody crossings would incorporate WGFD design specifications and professional engineering standards, as applicable. Open-bottom culverts will be used where appropriate to avoid changing stream morphology or removing suitable fish habitat. In addition, such waterbody crossings and culverts would be constructed in a manner that prevents sediment erosion, deposition of sediment, and minimizes impacts to any environmentally sensitive areas.	X	X	X	
WQ-12	Excavated material or other construction materials will not be stockpiled or deposited on or near stream banks, pond shorelines, or other watercourse perimeters where they can be washed away by storm runoff or can, in any way, encroach upon the actual water body itself.		X		
WQ-13	Water quality BMPs would be implemented at waterbody crossings to minimize any unforeseen impacts to the Platte River System's watershed and associated vegetation communities.		X		X
WQ-14	If new groundwater wells are required for construction or operation, the Project will coordinate with the WY State Engineer to ensure withdrawal volumes will not adversely affect supplies for other uses.	X	X	X	

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FIGURES

ConnectGEN

Rail Tie Wind Project

Figure 1
Project Area

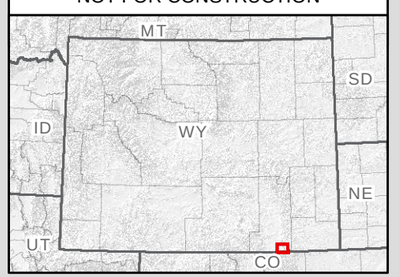
Albany County, WY

Project Area
State/County Boundary
Highways
County Roads
Railroad
Transmission Line
HUC 10 Watershed Boundary

N

0 0.5 1 2
Miles

NOT FOR CONSTRUCTION



TETRA TECH

Albany County, Wyoming
Larimer County, Colorado

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Rail Tie Wind Project

Figure 2
Representative Project Layout and Siting Corridor

Albany County, WY

- Project Area
- Siting Corridor

Representative Project Layout

- Turbine
- Met Tower
- Access Road
- Collection Line
- Crane Path
- Transmission Line
- Project Substation
- Interconnection Switchyard
- Laydown Yard
- O&M Site
- State/County Boundary
- Highways
- County Roads
- Railroads

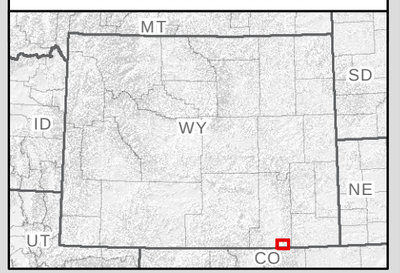
NOTE: WTG locations shown in the figure are representative and may change based on final engineering, environmental review and WTG model selection.

N

0 0.5 1 2

Miles

NOT FOR CONSTRUCTION



TETRA TECH

Albany County, Wyoming

Larimer County, Colorado

Tie Siding

Sportsman Lake Rd

Union Pacific Railroad

Stevenson Rd

Hermosa Rd

Iron Horse Rd

Klondike Rd

Davis Pkwy

Rams Horn Rd

Dale Creek Rd

Monument Rd

Pumpkin Vine Rd

Cherokee Park Rd

Boulder Ridge Rd

Bobcat Ridge Rd

Elk Crossing Rd

Deer Crossing Rd

287 80 222 234 241 319 31 59

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Rail Tie Wind Project

Figure 3
Field-Verified Land Cover

Albany County, WY

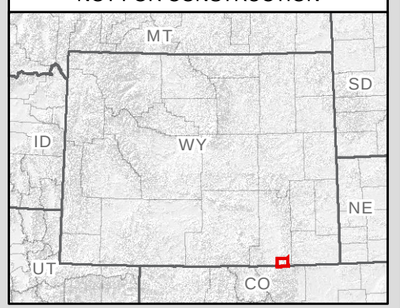
Project Area
Siting Corridor
State/County Boundary
Highways
County Roads

Field-Verified Land Cover
- Open Water
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Shrub/Scrub
- Pasture/Hay
- Herbaceous Wetland
- Woody Wetland

N

0 0.5 1 2
Miles

NOT FOR CONSTRUCTION



TETRA TECH

Albany County, Wyoming
Larimer County, Colorado

Tie Siding

Sportsman Lake Rd
Stevenson Rd
Hermosa Rd
Iron Horse Rd
Klondike Rd
Dale Rd
Davis Pkwy
Rams Horn Rd
Poudre Rd
Dale Creek Rd
Monument Rd
Pumpkin Vine Rd
Robinson Rd
Cherokee Park Rd
Boulder Ridge Rd
Bobcat Ridge Rd
Elk Crossing Rd
Deer Crossing Rd

287
222
231
241
234
80
31
319
59

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ConnectGEN

Rail Tie Wind Project

Figure 4
NRCS Hydric Soils

Albany County, WY

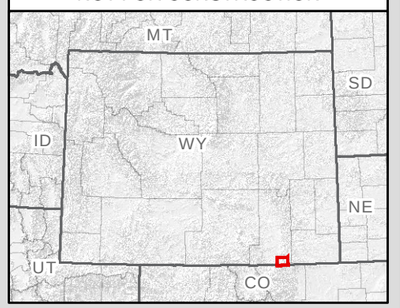
Project Area
Siting Corridor
State/County Boundary

Hydric Soil Rating
Partially Hydric
Not Hydric

N

0 0.5 1 2
Miles

NOT FOR CONSTRUCTION



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Albany County, Wyoming
Larimer County, Colorado

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ConnectGEN

Rail Tie Wind Project

Figure 5
FEMA Floodplains

Albany County, WY

Lone Tree Creek
Dry Creek
Pump Creek
Willow Creek
Dale Creek
West Fork Dale Creek
Fish Creek
Albany County, Wyoming
Larimer County, Colorado

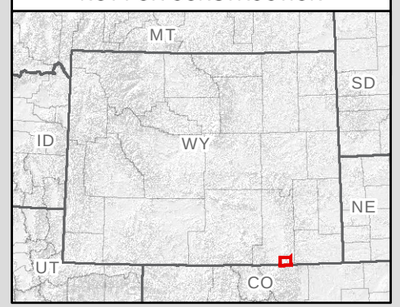
- Project Area
- Siting Corridor
- State/County Boundary
- NHD Perennial Stream
- 1% Annual Chance Flood Hazard

N

0 0.5 1 2

Miles

NOT FOR CONSTRUCTION



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Rail Tie Wind Project

Figure 6
NWI Wetlands and
NHD Waters

Albany County, WY

- Project Area
- Siting Corridor
- State/County Boundary
- Highways
- County Roads

NHD Stream Type

- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- NHD Waterbody

NWI Wetland Type

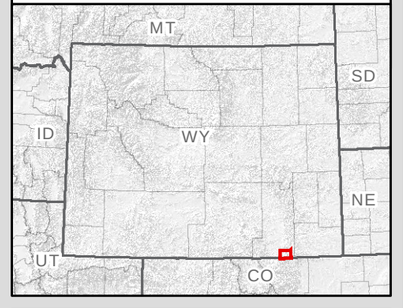
- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

N

0 0.5 1 2

Miles

NOT FOR CONSTRUCTION



TETRA TECH

Albany County, Wyoming
Larimer County, Colorado

Tie Siding

Sportsman Lake Rd
Government Creek
Robinson Rd
Willow Creek
Steverson Rd
Horney Creek
Dry Creek
Hermosa Rd
Grant Creek
Dale Creek Rd
Pump Creek
Dale Creek
Lone Tree Creek
Iron Horse Rd
Klondike Rd
Dale Rd
Davis Pkwy
Poudre Rd
Rams Horn Rd
Monument Rd
Johnson Creek
Pumpkin Vine Rd
West Fork Dale Creek
Mud Creek
Fish Creek
Elk Crossing Rd
Cherokee Park Rd
Boulder Creek
Forest Creek
Brush Creek
Boulder Ridge Rd
Little Fish Creek
Bobcat Ridge Rd
Deer Crossing Rd

287 222 80 234 231 241 31 319 59

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Rail Tie Wind Project

Figure 7
Aquifers

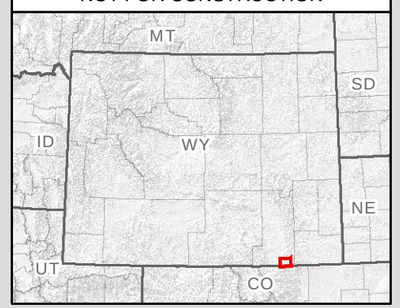
Albany County, WY

Project Area
Siting Corridor
State/County Boundary
Mesozoic
Paleozoic
Precambrian
Quaternary

N

0 0.5 1 2
Miles

NOT FOR CONSTRUCTION



TETRA TECH

Albany County, Wyoming

Larimer County, Colorado

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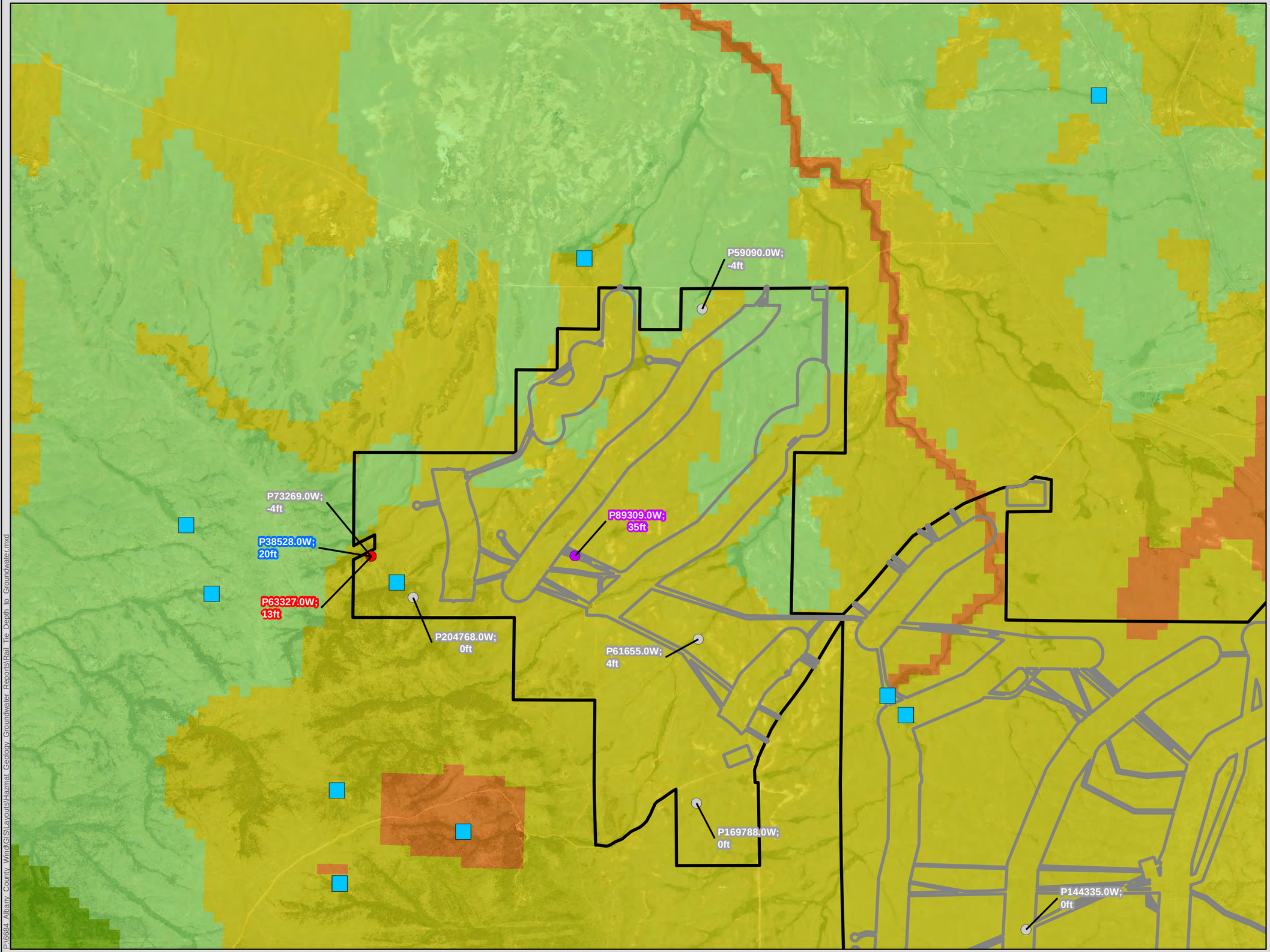
ConnectGEN

Rail Tie Wind Project

Depth to Groundwater
Map 8-1 of 8-4

Albany County, WY



- Spring
- Project Area
- Siting Corridor
- State/County Boundary

Depth to Groundwater

- 0-10ft
- 10-20ft
- 20-50ft
- 50-100ft

Groundwater Wells

Static Water Depth

- < 0-10 ft
- 10 -20 ft
- 20 - 50 ft

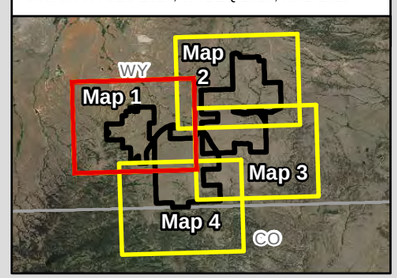
N

0 0.25 0.5 1

Miles

NOT FOR CONSTRUCTION

Source: WYSEO 2016, WYDEQ 2019, NHD 2019



TETRA TECH

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ConnectGEN

Rail Tie Wind Project

Depth to Groundwater
Map 8-2 of 8-4

Albany County, WY

Spring
Project Area
Siting Corridor
State/County Boundary

Depth to Groundwater
0-10ft
10-20ft
20-50ft

Groundwater Wells
Static Water Depth
< 0-10 ft
10 -20 ft

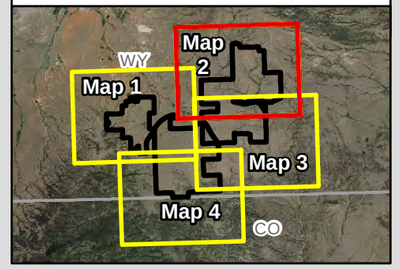
P16218.0P; 3ft
P16167.0P; 1ft
P42453.0W; 3ft
P16217.0P; 3ft
P163098.0W; 0ft
P42455.0W; 3ft
P16216.0P; 2ft
P16215.0P; 3ft
P163097.0W; 0ft
P40497.0W; 2ft
P16221.0P; 3ft
P16165.0P; 1ft
P49883.0W; 20ft
P48411.0W; 14ft
P16162.0P; 1ft
P16220.0P; 4ft
P16166.0P; 4ft
P40498.0W; 2ft
P16163.0P; 12ft
P48410.0W; 14ft

N

0 0.25 0.5 1
Miles

NOT FOR CONSTRUCTION

Source: WYSEO 2016, WYDEQ 2019, NHD 2019



TETRA TECH

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P16165.0P; 1ft
P16221.0P; 3ft
P49883.0W; 20ft
P48411.0W; 14ft
P16162.0P; 1ft
P16220.0P; 4ft
P16166.0P; 4ft
P40498.0W; 2ft
P16163.0P; 12ft
P48410.0W; 14ft
P144595.0W; 49ft
P19333.0W; 8ft
P19334.0W; 8ft
P144334.0W; 63ft
P19335.0W; 8ft
P16219.0P; 3ft
P161238.0W; -4ft
P30938.0W; 15ft
P35805.0W; 15ft

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ConnectGEN

Rail Tie Wind Project

Depth to Groundwater
Map 8-3 of 8-4

Albany County, WY

Project Area
Siting Corridor
State/County Boundary

Depth to Groundwater
0-10ft
10-20ft
20-50ft

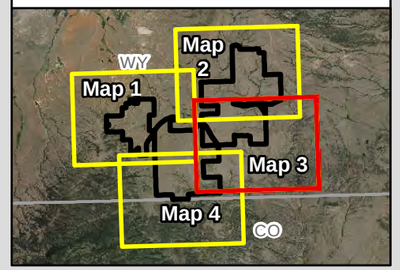
Groundwater Wells
Static Water Depth
< 0-10 ft
10 -20 ft
20 - 50 ft
50 - 100 ft

N

0 0.25 0.5 1
Miles

NOT FOR CONSTRUCTION

Source: WYSEO 2016, WYDEQ 2019, NHD 2019



TETRA TECH

ConnectGEN

Rail Tie Wind Project

Depth to Groundwater
Map 8-4 of 8-4

Albany County, WY

P144335.0W; 0ft

P130676.0W; 32ft

P92182.0W; 67ft

Albany County, Wyoming

Larimer County, Colorado

Spring
Project Area
Siting Corridor
State/County Boundary

Depth to Groundwater
0-10ft
10-20ft
20-50ft

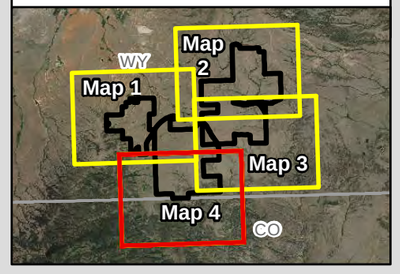
Groundwater Wells
Static Water Depth
< 0-10 ft
20 - 50 ft
50 - 100 ft

N

0 0.25 0.5 1
Miles

NOT FOR CONSTRUCTION

Source: WYSEO 2016, WYDEQ 2019, NHD 2019



TETRA TECH

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ConnectGEN

Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-1 of 9-12

Albany County, WY
March 2020

POND-RLST-01
SW-55
W-RLST-01
W-RLST-08
SW-56
SW-57
W-RLST-02
SW-17
S-RLST-03
SW-58
SW-16
SW-15
S-RLST-01
W-RLST-03
SW-06
SW-05
W-RLST-07
W-RLST-06
SW-04
SW-07
W-RLST-05
POND-RLST-02
SW-14
W-RLST-04
SW-08
SW-13
SW-18
SW-03
SW-12
SW-19
S-RLST-02
SW-02
SW-01
S-RLST-04
SW-20
POND-RLST-03
W-RLST-10
SW-09
S-RLST-06
Continued
SW-65

- Project Boundary
- Siting Corridor

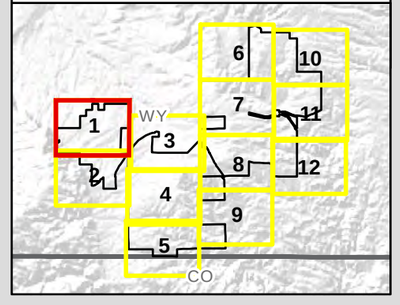
Wetland Delineation Survey

- Swale
- Ephemeral Stream
- Intermittent Stream
- Open Water
- PEM Wetland

N

0 500 1,000 2,000
Feet

NOT FOR CONSTRUCTION



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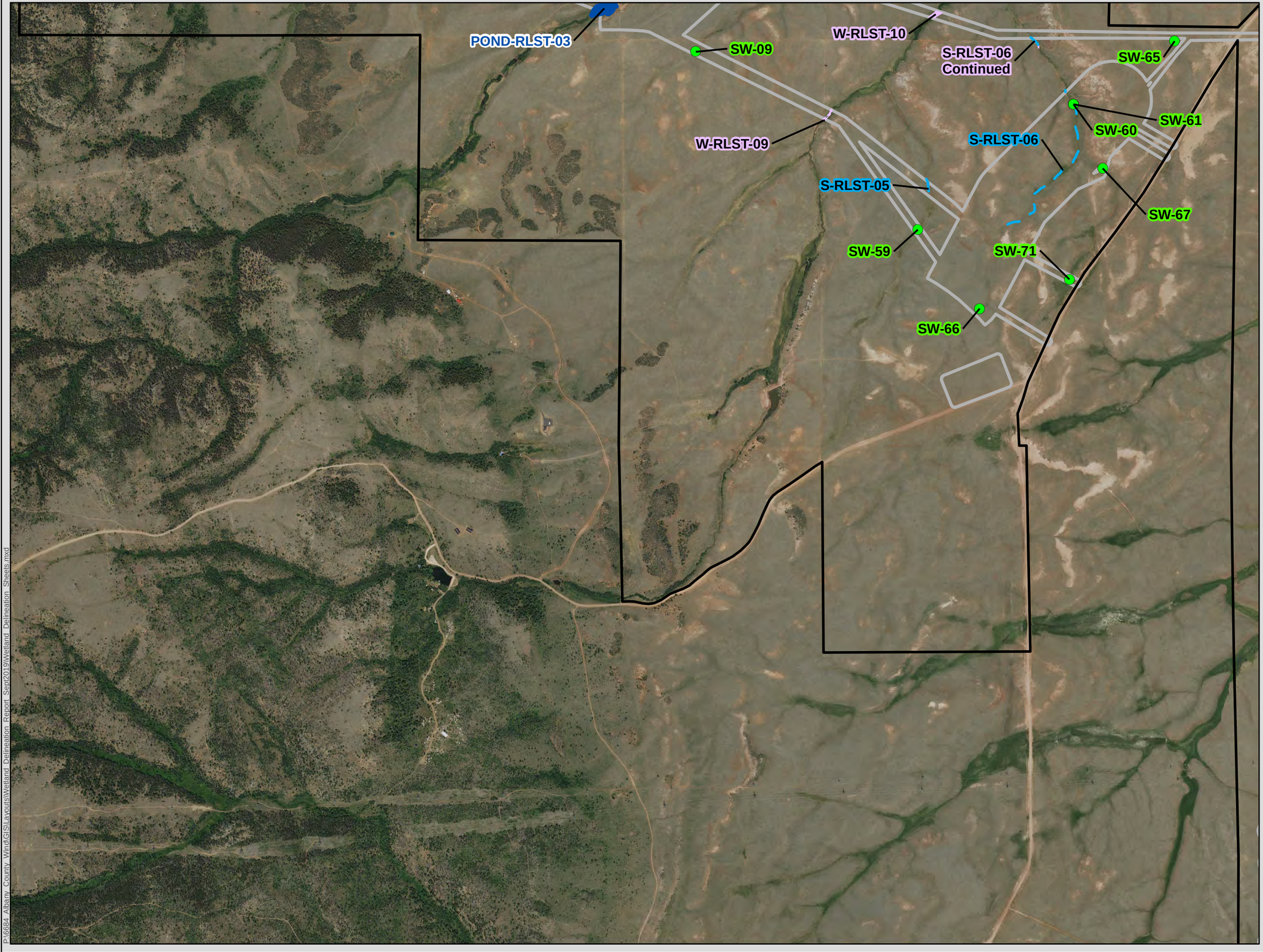


ConnectGEN

Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-2 of 9-12

Albany County, WY
March 2020

- Project Boundary
- Siting Corridor

Wetland Delineation Survey

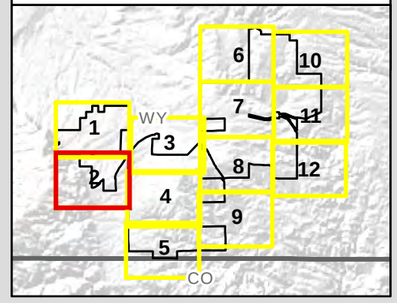
- Swale
- Ephemeral Stream
- Open Water
- PEM Wetland

N

0 500 1,000 2,000

Feet

NOT FOR CONSTRUCTION



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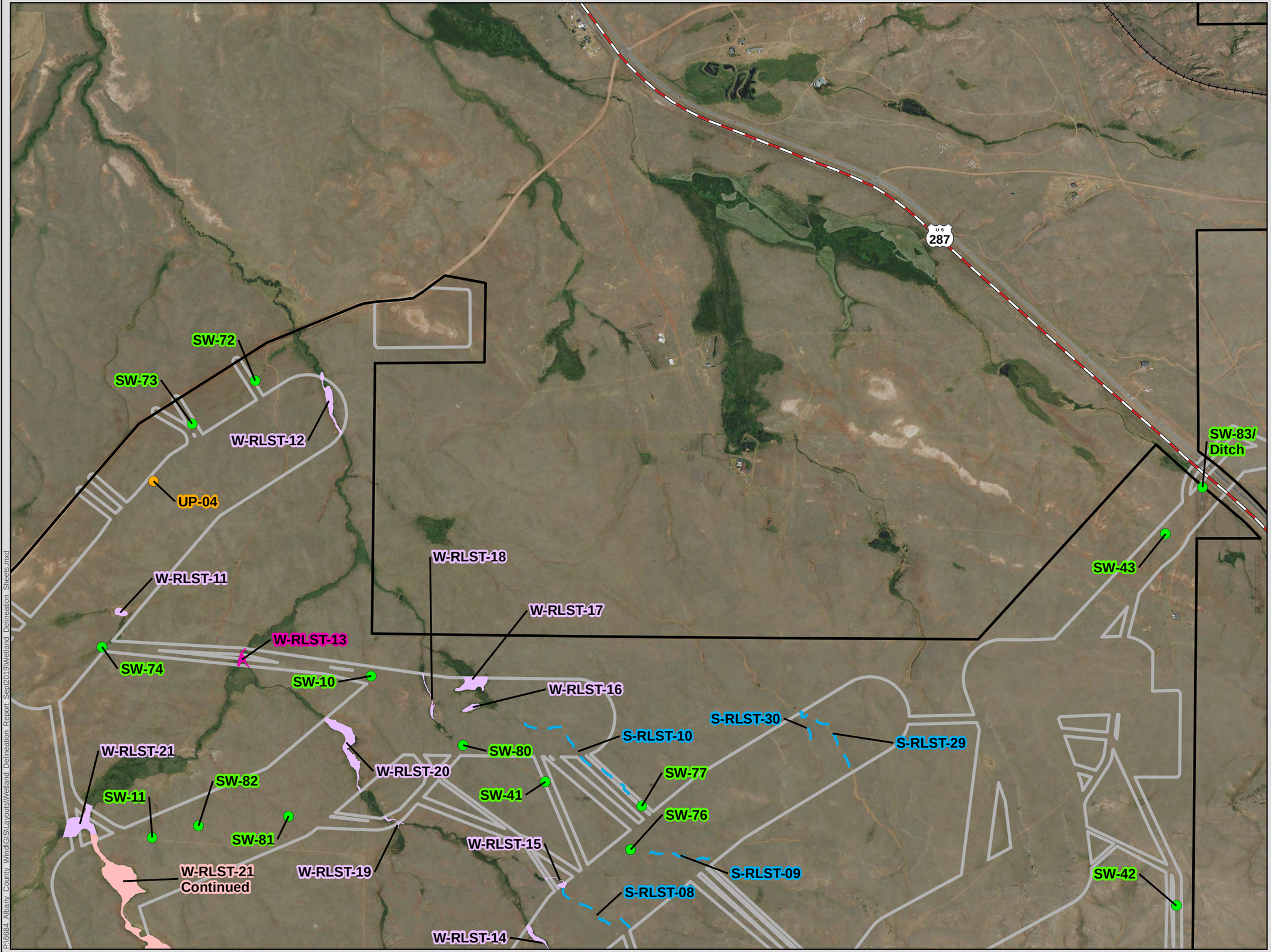

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ConnectGEN

Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-3 of 9-12

Albany County, WY
March 2020

- Project Boundary
- Siting Corridor

Wetland Delineation Survey

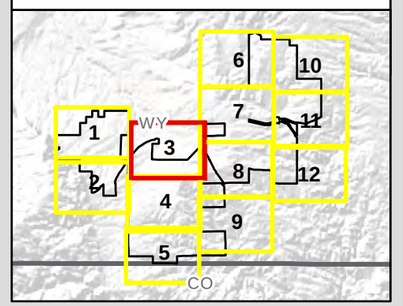
- Swale
- Upland
- Ephemeral Stream
- PEM Wetland
- PEM/PSS Wetland
- PSS Wetland

N

0 500 1,000 2,000

Feet

NOT FOR CONSTRUCTION



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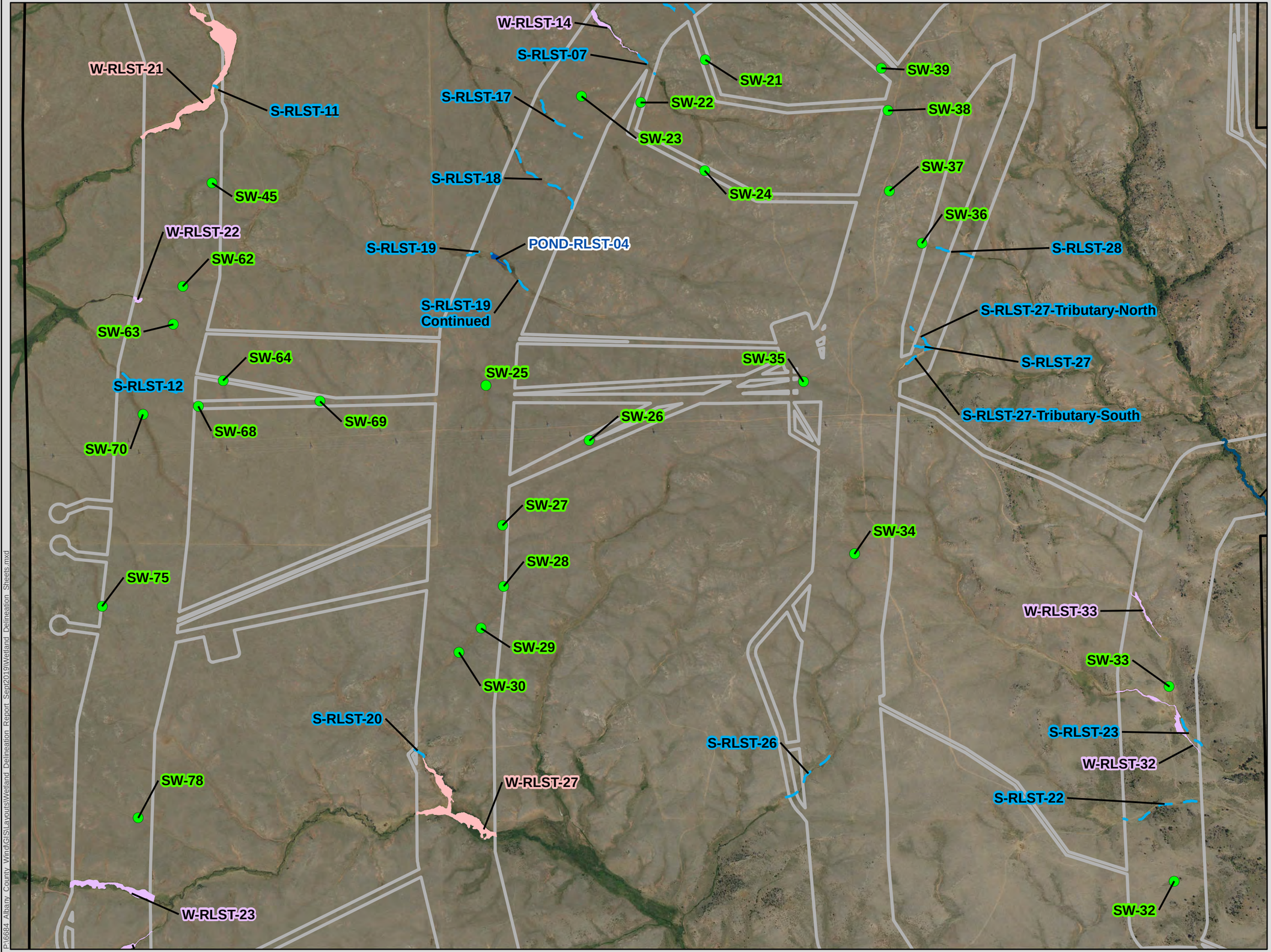

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Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-4 of 9-12

Albany County, WY
March 2020

- Project Boundary
- Siting Corridor

Wetland Delineation Survey

- Swale
- Ephemeral Stream
- Perennial Stream
- Open Water
- PEM Wetland
- PEM/PSS Wetland

N

0 500 1,000 2,000
Feet

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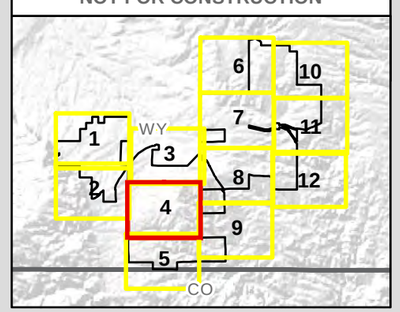

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Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-5 of 9-12

Albany County, WY
March 2020

W-RLST-23
SW-79
W-RLST-24
SW-84
S-RLST-16
S-RLST-15
W-RLST-26
SW-85
S-RLST-14
W-RLST-25
W-RLST-28
W-RLST-30
S-RLST-21
SW-32
W-RLST-29
SW-86
S-RLST-13

Wyoming
Colorado
Albany County
Larimer County

Project Boundary
Siting Corridor

Wetland Delineation Survey

- Swale
- Ephemeral Stream
- PEM Wetland
- PEM/PSS Wetland
- PSS Wetland

N

0 500 1,000 2,000
Feet

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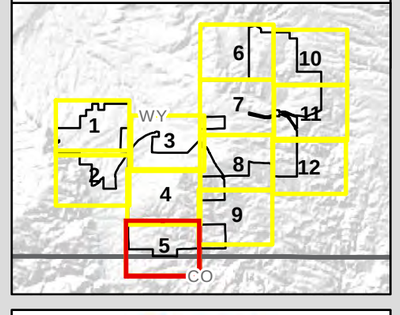

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Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-6 of 9-12

Albany County, WY
March 2020

SW-88
SW-87
SW-89
SW-54
S-RLST-52
S-RLST-51
UP-03
SW-53
S-RLST-50
S-RLST-49
W-RLST-54
W-RLST-55

Project Boundary
Siting Corridor

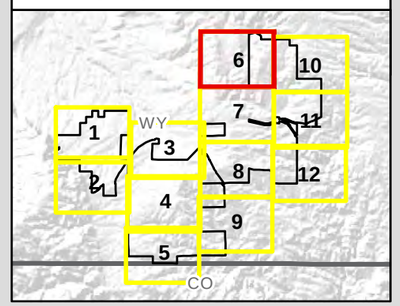
Wetland Delineation Survey

Swale
Upland
Ephemeral Stream
PEM Wetland
PSS Wetland

N

0 500 1,000 2,000
Feet

NOT FOR CONSTRUCTION



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Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-7 of 9-12

Albany County, WY
March 2020

W-RLST-42
W-RLST-43
W-RLST-41
W-RLST-40
W-RLST-40 Continued
UP-05
SW-44
S-RLST-33
W-RLST-39
S-RLST-32
S-RLST-31
S-RLST-34
SW-46
S-RLST-53
W-RLST-38
W-RLST-37
S-RLST-44

Project Boundary
Siting Corridor

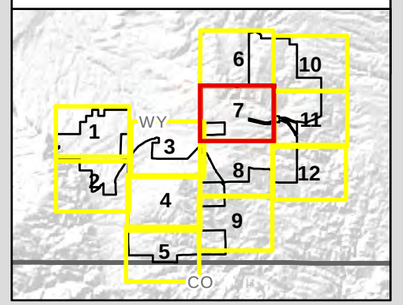
Wetland Delineation Survey

Swale
Upland
Ephemeral Stream
Intermittent Stream
Perennial Stream
PEM Wetland
PSS Wetland

N

0 500 1,000 2,000
Feet

NOT FOR CONSTRUCTION



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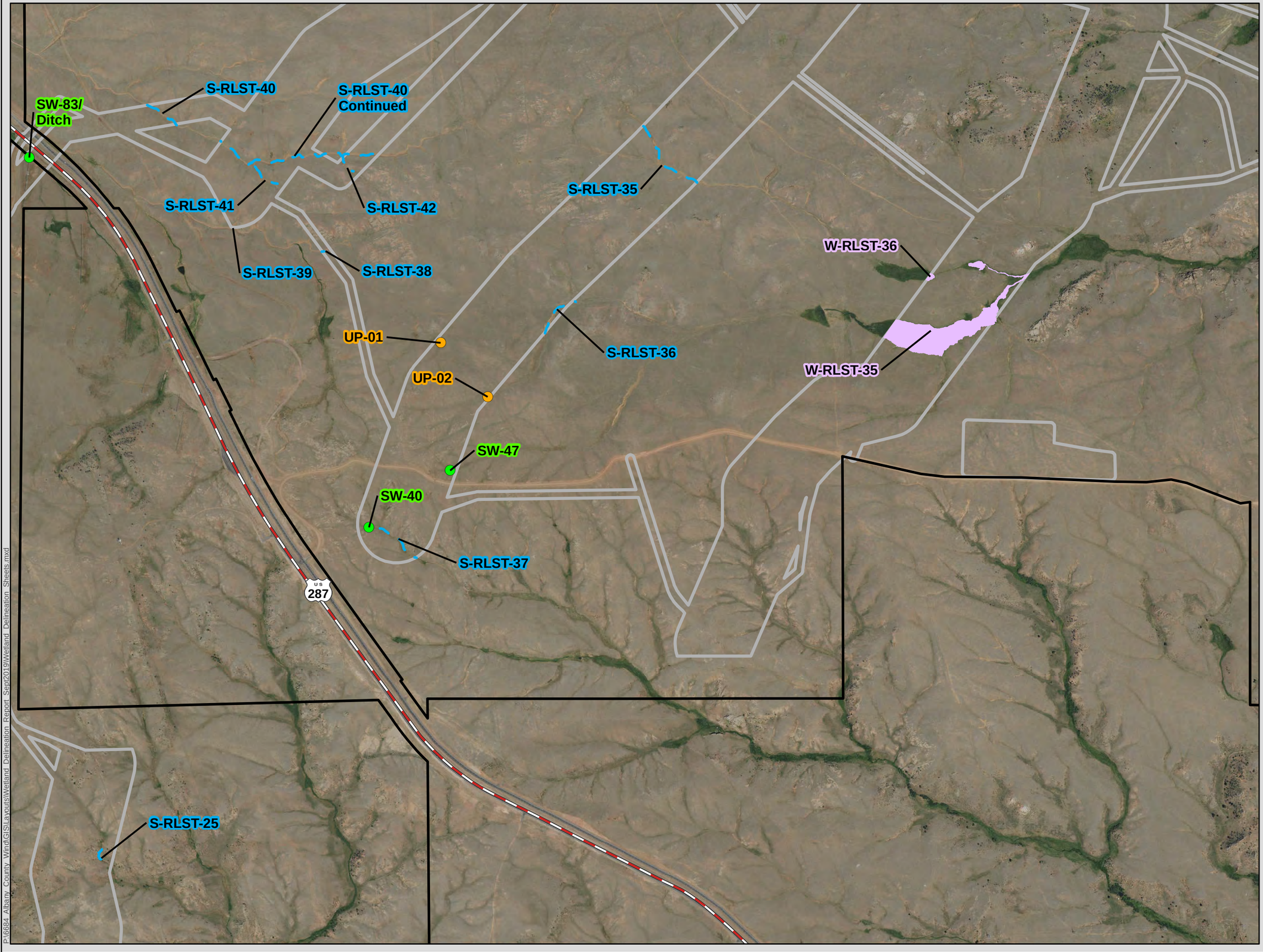

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Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-8 of 9-12

Albany County, WY
March 2020

- Project Boundary
- Siting Corridor

Wetland Delineation Survey

- Swale
- Upland
- Ephemeral Stream
- PEM Wetland

N

0 500 1,000 2,000

Feet

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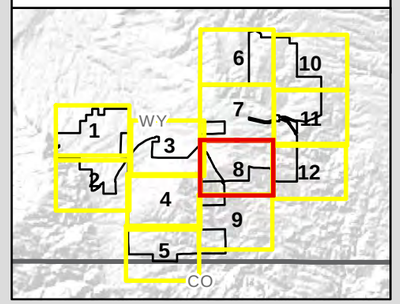

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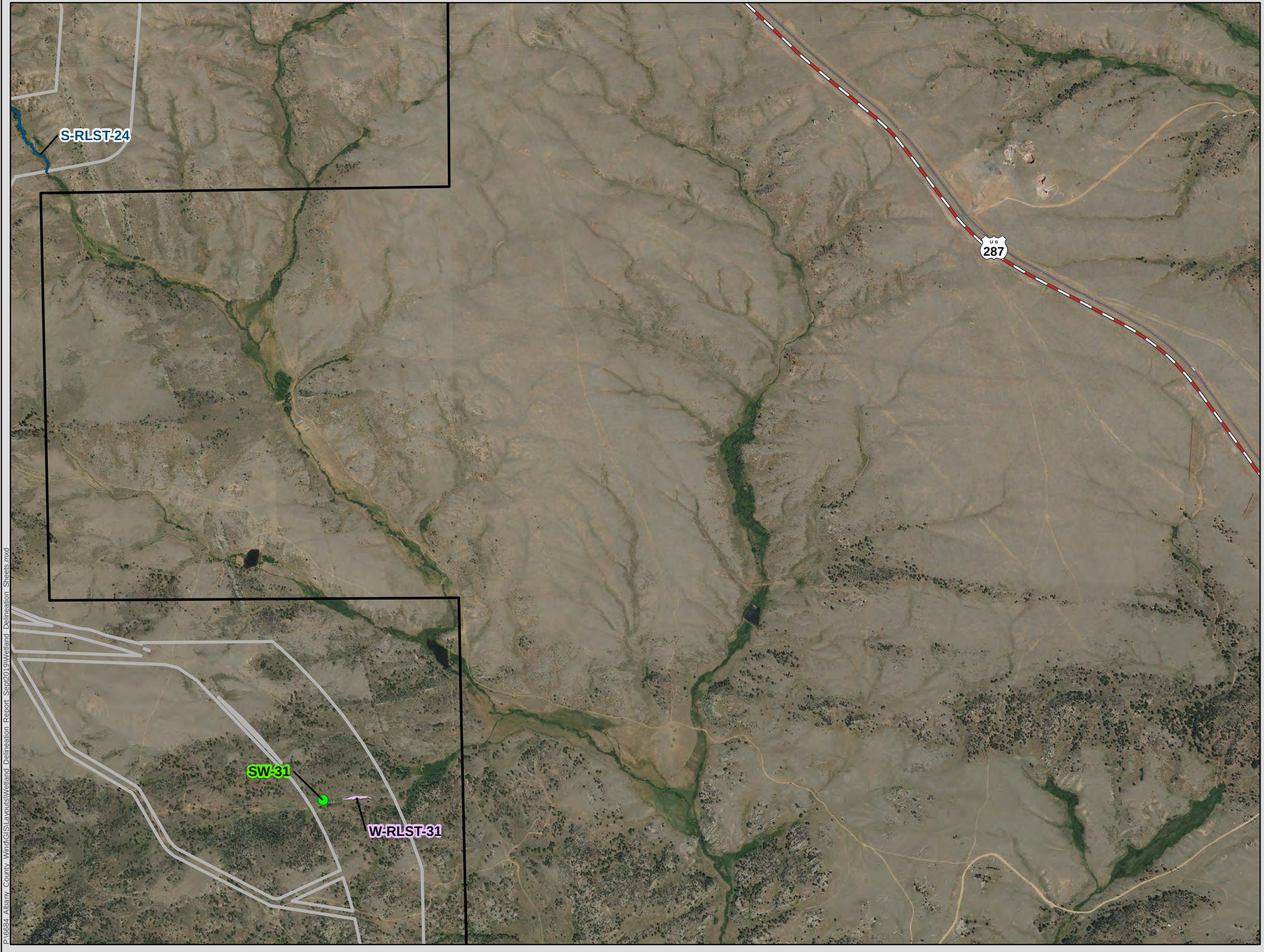

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Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-9 of 9-12

Albany County, WY
March 2020

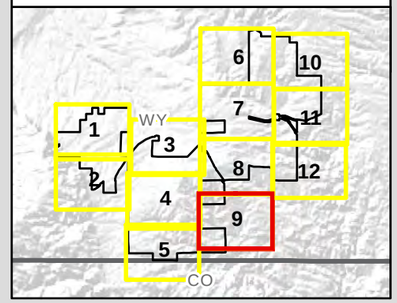
Project Boundary
Siting Corridor

Wetland Delineation Survey
Swale
Perennial Stream
PEM Wetland

N

0 500 1,000 2,000
Feet

NOT FOR CONSTRUCTION



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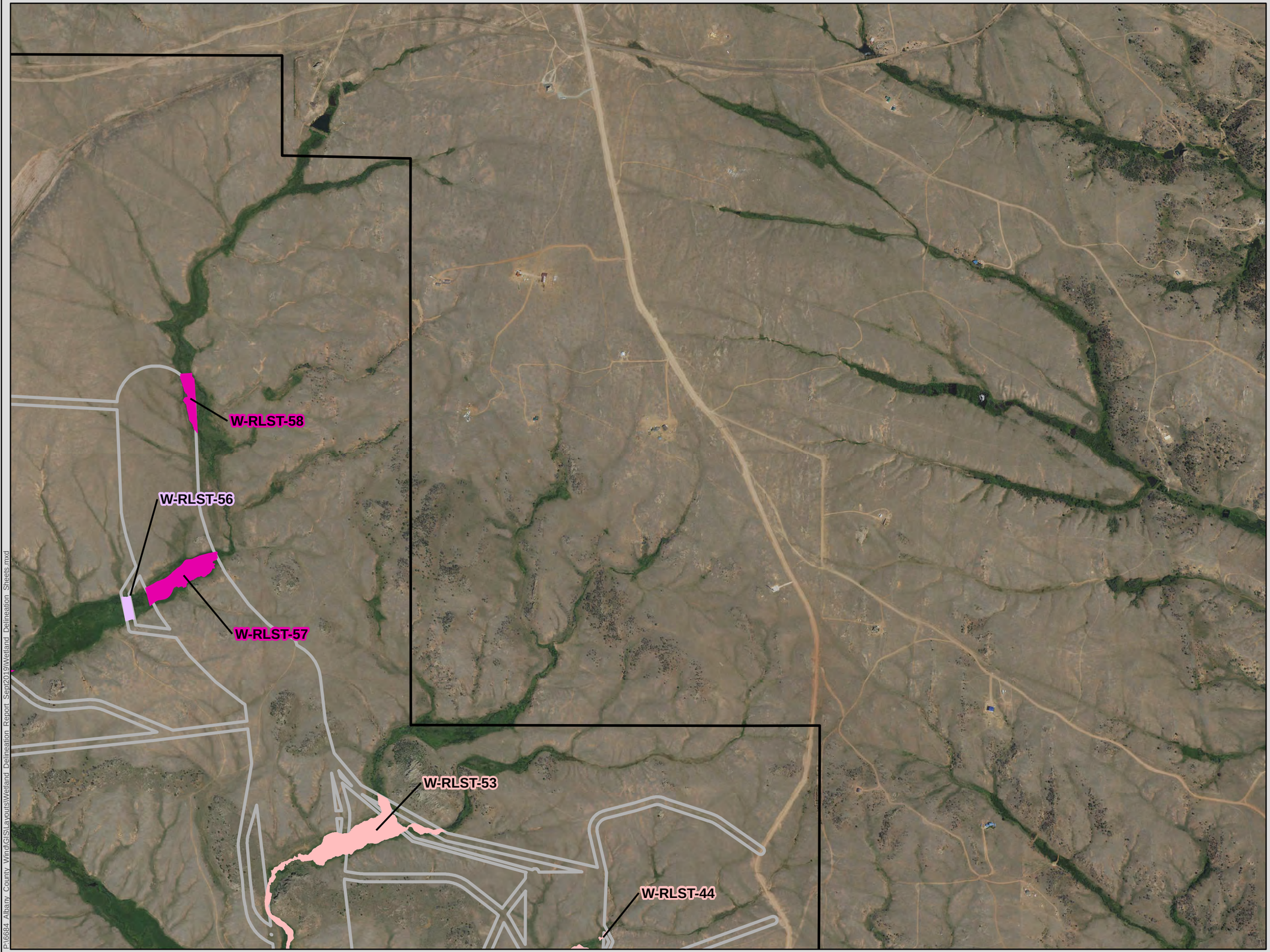

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Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-10 of 9-12

Albany County, WY
March 2020

Project Boundary
Siting Corridor

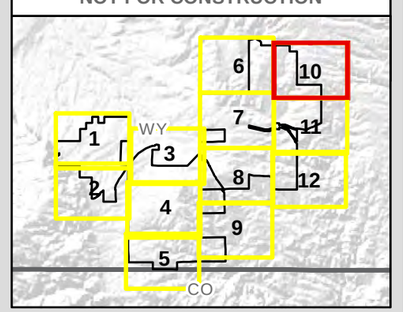
Wetland Delineation Survey

PEM Wetland
PEM/PSS Wetland
PSS Wetland

N

0 500 1,000 2,000
Feet

NOT FOR CONSTRUCTION



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W-RLST-53
W-RLST-45
S-RLST-47
SW-49
W-RLST-52
S-RLST-48
SW-48
S-RLST-46
S-RLST-45
W-RLST-51
W-RLST-46
SW-51
SW-50
W-RLST-50
W-RLST-49
W-RLST-47
S-RLST-43
S-RLST-43
SW-52
W-RLST-48

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Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-11 of 9-12

Albany County, WY
March 2020

- Project Boundary
- Siting Corridor

Wetland Delineation Survey

- Swale
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- PEM Wetland
- PEM/PSS Wetland
- PSS Wetland

N

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Feet

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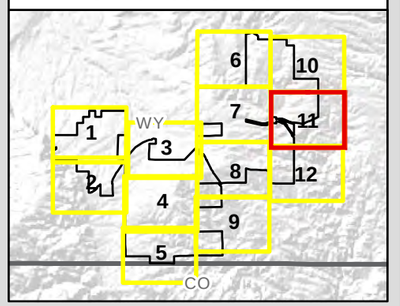

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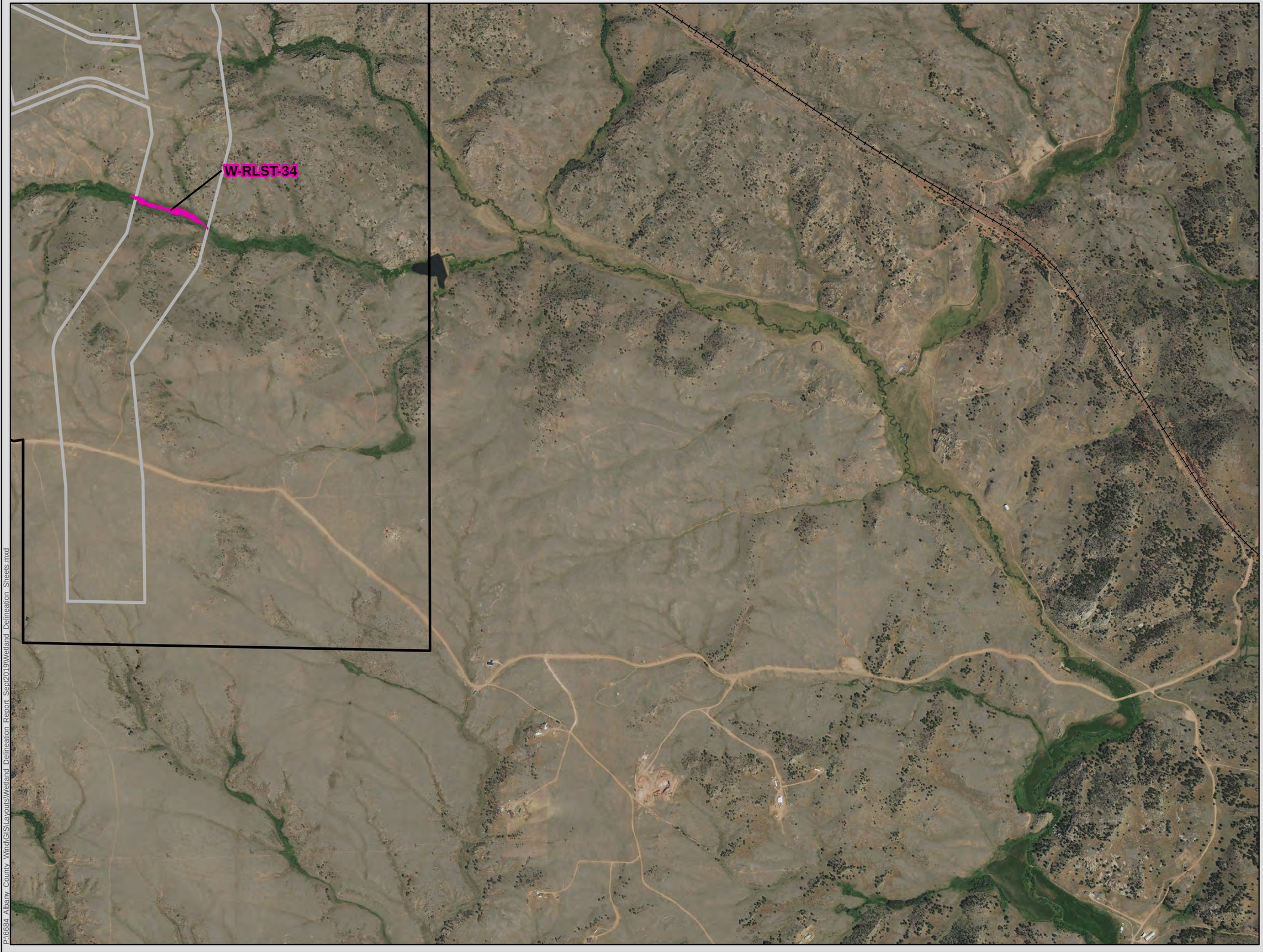

ConnectGEN

Rail Tie Wind Project

Wetlands and other Waterbodies Field Reconnaissance Results

Map 9-12 of 9-12

Albany County, WY
March 2020

Project Boundary

Siting Corridor

Wetland Delineation Survey

PSS Wetland

N

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Feet

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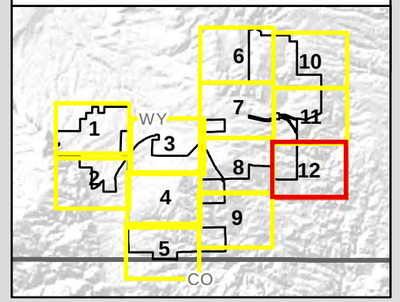

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APPENDIX A:
Field Reconnaissance Photographs

ConnectGEN

Rail Tie Wind Project

Photo Locations

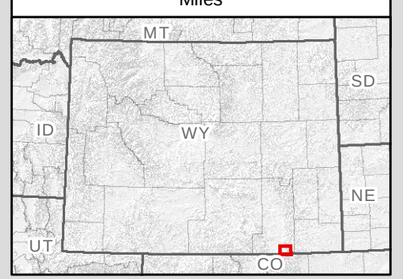
Albany County, WY

- 1 Photo Locations
- Project Area
- State/County Boundary
- Highways
- County Roads

N

0 0.5 1 2

Miles



TETRA TECH

Albany County, Wyoming

Larimer County, Colorado

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Photo 1. Representative view of northwestern portion of the Siting Corridor, facing southwest at swale SW-16. Area is dominated by dwarf sagebrush scrub in generally flat terrain and is heavily grazed by cattle.

Photo 2. Representative view of southern portion of the Siting Corridor, facing south at ephemeral stream S-RLST-13. Area is dominated by limber pine-juniper woodland and sagebrush steppe in hilly terrain.

Photo 3. Representative view of central portion of the Siting Corridor, facing west at swale SW-37. Area is dominated by dwarf sagebrush scrub in generally flat terrain and is heavily grazed by cattle.

Photo 4. Representative view of northeastern portion of the Siting Corridor, facing east near W-RSLT-38, a tributary to Dale Creek. Area is dominated by rolling dwarf sagebrush scrub terrain supporting riparian scrub/shrub drainages and rocky outcrops.

Photo 5. Photo facing north of a palustrine emergent (PEM) wetland, W-RLST-21, along Willow Creek within the Siting Corridor. W-RLST-21 is dominated by sedges, rushes, spikerushes, and wetland grasses. Willow Creek drains north from this location through the wetland.

Photo 6. Photo facing northwest of a palustrine scrub/shrub (PSS) wetland, W-RLST-54, along Pump Creek within the Siting Corridor. W-RLST-54 is dominated by a diverse assemblage of willows. Pump Creek drains south from this location through the wetland.

Photo 7. Photo facing southeast of a PEM wetland, W-RLST-18, along a tributary to Willow Creek within the Siting Corridor. Here W-RLST-18 lies within the banks of Willow Creek and may function as a riverine wetland. W-RLST-18 is dominated by sedges, all or most of which are below the ordinary high water mark for this small, intermittent stream.

Photo 8. Photo facing east of a PEM/PSS wetland, W-RLST-29, along a perennial tributary to Fish Creek within the Siting Corridor. W-RLST-29 is dominated by matrix of herbaceous species such as sedges and rushes, and shrub species such as willows.

Photo 9. Photo facing east of an ephemeral stream, S-RLST-40, within the Siting Corridor. S-RLST-40 is a tributary to Grant Creek containing an obvious scoured stream bed, but no evidence of standing or flowing water at the time of survey.

Photo 10. Photo facing east of an intermittent stream, S-RLST-47, within the Siting Corridor. S-RLST-47 is a tributary to Pump Creek containing well-defined bed and banks with pools of standing water.

Photo 11. Photo facing southeast of perennial stream Fish Creek (within the boundary of W-RLST-23 at this location) within the Siting Corridor. Fish Creek drains southeast through the Siting Corridor to Dale Creek and exhibits a defined bed and bank with flowing water.

Photo 12. Photo facing northeast of open water pond, POND-RLST-02, along Government Creek within the Siting Corridor. POND-RLST-03 is an excavated stock pond adjacent to W-RLST-04 upstream.

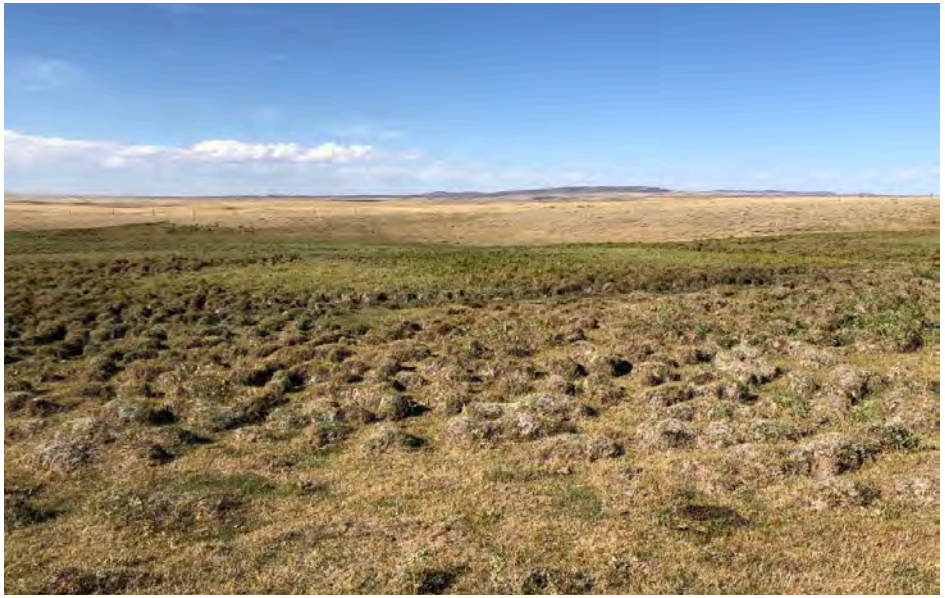

Photo 13. Photo facing northwest of suspected fen wetland, W-RLST-17, along a tributary to Willow Creek within the Siting Corridor. The fen has characteristic hummocky microtopography due to the spongy nature of the peat soils and the active use of this area for cattle grazing.

Photo 14. Photo facing west of suspected fen wetland, W-RLST-35, along Johnson Creek within the Siting Corridor. Suspected fen has characteristic hummocky microtopography, peat soils, and sedge-dominated vegetation, and is associated with open water habitat within portions of the wetlands.

Photo 15. Photo facing southwest of an upland swale, SW-34, along an NHD-mapped blue line feature within the Siting Corridor. SW-34 is a curvilinear feature that focuses overland runoff, but lacks obvious scour, defined bed and banks, and hydrophytic vegetation.

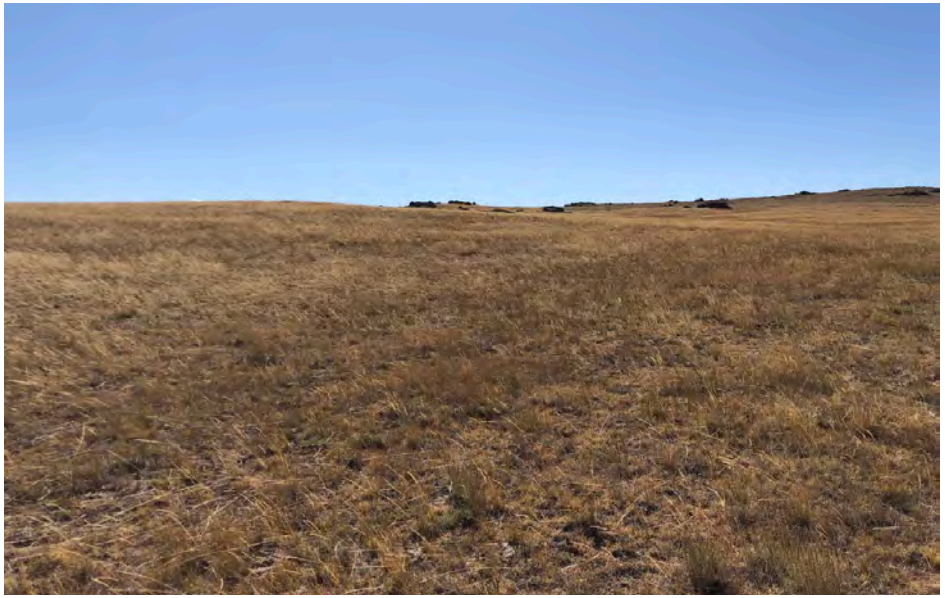

Photo 16. Photo facing southwest of upland location, UP-02, located along an NHD-mapped blue line feature within the Siting Corridor. UP-03 does not have any drainage topography in this area reflective of a stream or swale feature.

APPENDIX B:
Plant Species Observed During the Field Reconnaissance

APPENDIX B: Plant Species Observed During the Field Reconnaissance

Species	Scientific Name
Trees	
Aspen	*Populus tremuloides*
Limber pine	*Pinus flexilis*
Narrowleaf cottonwood	*Populus angustifolia*
Ponderosa pine	*Pinus ponderosa*
Rocky Mountain maple	*Acer glabrum*
Thinleaf alder	*Alnus incana*
Shrubs	
Antelope bitterbrush	*Purshia tridentata*
Bebb willow	*Salix bebbiana*
Bluestem willow	*Salix irrorata*
Chokecherry	*Padus virginiana*
Common juniper	*Juniperus communis var. depressa*
Coyote willow	*Salix exigua*
Fendler's ceanothus, buckbrush	*Ceanothus fendleri*
Fringed sage	*Artemisia frigida*
Kinnikinnick	*Arctostaphylos uva-ursi*
Mountain mahogany	*Cercocarpus montanus*
Oregon grape	*Mahonia repens*
Plains silver sagebrush	*Artemisia cana* spp. *cana*
Plane-leaf willow	*Salix planifolia*
Prickly-pear	*Opuntia polyacantha*
Rabbitbrush	*Chrysothamnus viscidiflorus*
Red osier dogwood	*Cornus sericea*
Shrubby cinquefoil	*Potentilla fruiticosa*
Soapweed yucca	*Yucca glauca*
Strapleaf willow	*Salix eriocephala* spp. *ligulifolia*
Twinberry honeysuckle	*Lonicera involucrata*
Waxcurrant	*Ribes cereum*
Western serviceberry	*Amelanchier alnifolia*
Western snowberry	*Symphoricarpos occidentalis*
Whitestem gooseberry	*Ribes inerme*
Woods' rose	*Rosa woodsii*
Wyoming big sagebrush	*Artemisia tridentata* spp. *wyomingensis*
Wyoming three-tip sagebrush	*Artemisia tripartita* spp. *rupicola*
Grasses	
American mannagrass	*Glyceria grandis*
Baltic rush	*Juncus balticus*
Beaked sedge	*Carex utriculata*
Blue grama	*Bouteloua gracilis*
Bluebunch wheatgrass	*Pseudoregneria spicata*
Bluejoint reedgrass	*Calamagrostis canadensis*
Brookgrass	*Catabrosa aquatica*
Canada bluegrass	*Poa compressa*
Cheatgrass	*Bromus tectorum*

APPENDIX B: Plant Species Observed During the Field Reconnaissance

Species	Scientific Name
Clustered field sedge	*Carex praegracilis*
Creeping bentgrass	*Agrostis stolinifera*
Creeping spikerush	*Eleocharis palustris*
Daggerleaf rush	*Juncus ensilfolius*
Fowl mannagrass	*Glyceria striata*
Foxtail barley	*Hordeum jubatum*
Indian ricegrass	*Acnatherum hymenoides*
Jointleaf rush	*Juncus articulatus*
Kentucky bluegrass	*Poa pratensis*
Longstyle rush	*Juncus longistylis*
Merten's rush	*Juncus mertensianus*
Mountain muhly	*Muhlenbergia montana*
Nebraska sedge	*Carex nebrascensis*
Needle and thread	*Hesperostipa comata*
Panicled bulrush	*Scirpus microcarpus*
Prairie junegrass	*Koeleria macrantha*
Reed canarygrass	*Phalaris arundinacea*
Sandberg bluegrass	*Poa secunda*
Six-weeks fescue	*Vulpia octaflora*
Sloughgrass	*Beckmannia syzigachne*
Smooth brome	*Bromus inermis*
Spike trisetum	*Trisetum spicatum*
Timothy	*Phleum pratense*
Toad rush	*Juncus bufonius*
Tufted hairgrass	*Deschampsia cespitosa*
Water sedge	*Carex aquatilis*
Western wheatgrass	*Pascopyrum smithii*
Forbs	
American brooklime	*Veronica americana*
Broadfruit bur-reed	*Sparganium eurycarpum*
Dropleaf buckwheat (tentative identification due to lack of flowers at the time of the field reconnaissance)	*Eriogonum exilifolium*
Few-flower buckwheat	*Eriogonum pauciflorum*
Bull thistle	*Cirsium vulgare*
Canada thistle	*Cirsium arvense*
Colorado aletes	*Aletes humilis (tentative ID)*
Common mullein	*Verbascum thapsus*
Common plantain	*Plantago major*
Coontail	*Ceratophyllum demersum*
Creeping nailwort	*Paronychia sessiliflora*
Dock species	*Rumex* sp.
Elk thistle	*Cirsium scariosum*
Fendler’s meadowrue	*Thalictrum fendleri*
Field mint	*Mentha arvensis*
Flixweed	*Descurainia sophia*

APPENDIX B: Plant Species Observed During the Field Reconnaissance

Species	Scientific Name
Forked spleenwort	*Asplenium setentrionale*
Fringed grass-of-Parnassus	*Parnassia fimbriata*
Giant angelica	*Angelica ampla*
Green gentian, monument plant	*Frasera speciosa*
Harebell	*Campanula rotundifolia*
Hawkweed	*Agoseris glauca*
Hood's phlox	*Phlox hoodii*
Hooker's sandwort	*Eremogone hookeri*
Houndstongue	*Cynoglossum officinale*
Largeleaf avens	*Geum macrophyllum*
Marsh violet	*Viola palustris*
Milkvetch species	*Astragalus* sp.
Missouri iris	*Iris missouriensis*
Musk thistle	*Carduus nutans*
Nylon hedgehog cactus	*Echinocereus viridiflorus*
Pale madwort	*Alyssum alyssoides*
Pineappleweed	*Matricaria discoidea*
Prairie goldenbanner	*Thermopsis rhombifolia*
Prairie sage, white sage	*Artemisia lucoviciana*
Prairie sunflower	*Helianthus petiolaris*
Prostrate vervain	*Verbena bracteata*
Pussytoes	*Antennaria parviflora*
Rayless groundsel	*Packera debilis or pauciflora*
Salsify	*Tragapogon dubius*
Silverleaf potentilla	*Potentilla anserina*
Simpon's ball cactus	*Pediocactus simpsonii*
Sticky purple geranium	*Geranium viscosissimum*
Stinging nettle	*Urtica dioica*
Stonecrop	*Sedum lanceolatum*
Sulfur buckwheat	*Eriogonum umbellatum*
Thrift mock goldenweed	*Stenotus armerioides*
Water cress	*Nasturium officinale*
Wavyleaf thistle	*Cirsium undulatum*
Wild licorice	*Glycyrrhiza lepidota*
Willowherb	*Epilobium* sp.
Yarrow	*Achillea millefolium*